



Exploding The Phone

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Bibliographic Cover Sheet

Title	FBI File 139-HQ-4173: Unknown Subjects; Alleged Interception of Communications of Government Officials; IOC; OO: Houston
Date	1972-11-13
Author(s)	FBI
Abstract	Referral from the DoJ Criminal Division concerning manufacture and use of blue box. According to source, blue boxes are "being used to intercept, without detection, telephone calls of high Government officials and that 21 unnamed U.S. Senators have purchased these devices for the purpose of bypassing possible wiretaps. One (redacted) is alleged to have stated he can get into NCIC through means of a blue box."
Keywords	blue box; FBI; senators; Senate; Department of Justice; DOJ; NCIC; Houston, TX
Notes	Obtained as part of FOIPA 1034080 (blue box part 1)
Source	FBI via FOIA

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U.S. Department of Justice

Federal Bureau of Investigation

Washington, D.C. 20535

October 31, 2007

Subject: BLUE BOXES

FOIPA No. 1034080- 001

Dear Requester:

The enclosed documents were reviewed under the Freedom of Information/Privacy Acts (FOIPA), Title 5, United States Code, Section 552/552a. Deletions have been made to protect information which is exempt from disclosure, with the appropriate exemptions noted on the page next to the excision. In addition, a deleted page information sheet was inserted in the file to indicate where pages were withheld entirely. The exemptions used to withhold information are marked below and explained on the enclosed Form OPCA-16a:

Section 552

- ☐ (b)(1)
- ☒ (b)(2)
- ☐ (b)(3) _____
- _____
- _____
- _____
- ☐ (b)(4)
- ☒ (b)(5)
- ☒ (b)(6)

Section 552a

- ☐ (b)(7)(A)
- ☐ (b)(7)(B)
- ☒ (b)(7)(C)
- ☒ (b)(7)(D)
- ☒ (b)(7)(E)
- ☐ (b)(7)(F)
- ☐ (b)(8)
- ☐ (b)(9)
- ☐ (d)(5)
- ☐ (j)(2)
- ☐ (k)(1)
- ☐ (k)(2)
- ☐ (k)(3)
- ☐ (k)(4)
- ☐ (k)(5)
- ☐ (k)(6)
- ☐ (k)(7)

203 **page(s)** were reviewed and 187 **page(s)** are being released.

☐ Document(s) were located which originated with, or contained information concerning other Government agency(ies) [OGA]. This information has been:

- ☐ referred to the OGA for review and direct response to you.
- ☐ referred to the OGA for consultation. The FBI will correspond with you regarding this information when the consultation is finished.

☒ You have the right to appeal any denials in this release. Appeals should be directed in writing to the Director, Office of Information and Privacy, U.S. Department of Justice, 1425 New York Ave., NW, Suite 11050, Washington, D.C. 20530-0001 within sixty days from the date of this letter. The envelope and the letter should be clearly marked "Freedom of Information Appeal" or "Information Appeal." Please cite the FOIPA number assigned to your request so that it may be easily identified.

☐ The enclosed material is from the main investigative file(s) in which the subject(s) of your request was the focus of the investigation. Our search located additional references, in files relating to other individuals, or matters, which may or may not be about your subject(s). Our experience has shown, when ident, references usually contain information similar to the information processed in the main file(s). Because of our significant backlog, we have given priority to processing only the main investigative file(s). If you want the references, you must submit a separate request for them in writing, and they will be reviewed at a later date, as time and resources permit.

☒ See additional information which follows.

Sincerely yours,



David M. Hardy
Section Chief
Record/Information
Dissemination Section
Records Management Division

Enclosure(s)

The enclosed documents contained in Headquarters files 139-HQ-4173, 62-HQ-31567, 87-HQ-121042, 87-HQ-131276, and 87-HQ-134468 represent the first interim release of information responsive to your Freedom of Information Act (FOIA) request. Additional material remains to be processed. Review of this material will continue unless you advise this Bureau to the contrary.

Extra file copies of the same document were not considered for processing and are not included in the number of pages reviewed.

As you have been previously advised, because your FOIA requests are similar in scope and content, that is, they constitute a series of related requests, you are being charged aggregate duplication fees for your requests concerning Blue Boxes and Phone Freaks. The authority to charge aggregate fees is located in Title 28, Code of Federal Regulations, Section 16.11(h).

Pursuant to Title 28, Code of Federal Regulations, Sections 16.10 and/or 16.49, there is a fee of ten cents per page for duplication. No fees are assessed for the first 100 pages. You have already received your 100 free pages. You are being charged at this time for the enclosed pages as well as the previously released 67 pages for FOIPA No. 1065071. Upon receipt of these documents please make a check or money order payable to the Federal Bureau of Investigation in the amount of \$25.40 for 254 released pages. To insure proper identification of your request, please return this letter or include the FOIPA request number(s) with your payment. Failure to pay for this interim release will close your current request as well as any pending FBI FOIA requests from you. Nonpayment will also cause an automatic denial of any future FOIA requests.

EXPLANATION OF EXEMPTIONS

SUBSECTIONS OF TITLE 5, UNITED STATES CODE, SECTION 552

- (b)(1) (A) specifically authorized under criteria established by an Executive order to be kept secret in the interest of national defense or foreign policy and (B) are in fact properly classified to such Executive order;
- (b)(2) related solely to the internal personnel rules and practices of an agency;
- (b)(3) specifically exempted from disclosure by statute (other than section 552b of this title), provided that such statute(A) requires that the matters be withheld from the public in such a manner as to leave no discretion on issue, or (B) establishes particular criteria for withholding or refers to particular types of matters to be withheld;
- (b)(4) trade secrets and commercial or financial information obtained from a person and privileged or confidential;
- (b)(5) inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency;
- (b)(6) personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy;
- (b)(7) records or information compiled for law enforcement purposes, but only to the extent that the production of such law enforcement records or information (A) could be reasonably be expected to interfere with enforcement proceedings, (B) would deprive a person of a right to a fair trial or an impartial adjudication, (C) could be reasonably expected to constitute an unwarranted invasion of personal privacy, (D) could reasonably be expected to disclose the identity of confidential source, including a State, local, or foreign agency or authority or any private institution which furnished information on a confidential basis, and, in the case of record or information compiled by a criminal law enforcement authority in the course of a criminal investigation, or by an agency conducting a lawful national security intelligence investigation, information furnished by a confidential source, (E) would disclose techniques and procedures for law enforcement investigations or prosecutions, or would disclose guidelines for law enforcement investigations or prosecutions if such disclosure could reasonably be expected to risk circumvention of the law, or (F) could reasonably be expected to endanger the life or physical safety of any individual;
- (b)(8) contained in or related to examination, operating, or condition reports prepared by, on behalf of, or for the use of an agency responsible for the regulation or supervision of financial institutions; or
- (b)(9) geological and geophysical information and data, including maps, concerning wells.

SUBSECTIONS OF TITLE 5, UNITED STATES CODE, SECTION 552a

- (d)(5) information compiled in reasonable anticipation of a civil action proceeding;
- (j)(2) material reporting investigative efforts pertaining to the enforcement of criminal law including efforts to prevent, control, or reduce crime or apprehend criminals;
- (k)(1) information which is currently and properly classified pursuant to an Executive order in the interest of the national defense or foreign policy, for example, information involving intelligence sources or methods;
- (k)(2) investigatory material compiled for law enforcement purposes, other than criminal, which did not result in loss of a right, benefit or privilege under Federal programs, or which would identify a source who furnished information pursuant to a promise that his/her identity would be held in confidence;
- (k)(3) material maintained in connection with providing protective services to the President of the United States or any other individual pursuant to the authority of Title 18, United States Code, Section 3056;
- (k)(4) required by statute to be maintained and used solely as statistical records;
- (k)(5) investigatory material compiled solely for the purpose of determining suitability, eligibility, or qualifications for Federal civilian employment or for access to classified information, the disclosure of which would reveal the identity of the person who furnished information pursuant to a promise that his/her identity would be held in confidence;
- (k)(6) testing or examination material used to determine individual qualifications for appointment or promotion in Federal Government service the release of which would compromise the testing or examination process;
- (k)(7) material used to determine potential for promotion in the armed services, the disclosure of which would reveal the identity of the person who furnished the material pursuant to a promise that his/her identity would be held in confidence.

FEDERAL BUREAU OF INVESTIGATION
FOIPA
DELETED PAGE INFORMATION SHEET

Serial Description ~ COVER SHEET

Total Deleted Page(s) ~ 6
Page 33 ~ b6, b7C, b7D
Page 34 ~ b6, b7C, b7D
Page 35 ~ b6, b7C, b7D
Page 75 ~ b2, b6, b7C, b7D
Page 76 ~ b2, b6, b7C, b7D
Page 77 ~ b2, b6, b7C, b7D

139-HQ-4173

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Airtel

11/13/72

TO: SAC, Houston

FROM: Acting Director, FBI

1- [redacted]
1- Mr. Conrad
1- Mr. Soyars

UNKNOWN SUBJECTS; INDIVIDUAL
ALLEGED INTERCEPTIONS OF COMMUNICATIONS
OF GOVERNMENT OFFICIALS
INTERCEPTION OF COMMUNICATIONS
OO: HO

b2
b6
b7C
b7D

Enclosed for Houston are two copies of a memorandum from the Assistant Attorney General, Criminal Division dated 11/8/72. *see 2*

Concerning individuals mentioned in the enclosed memorandum, see your files [redacted] and [redacted]. Review your office indices and pertinent files for additional information.

The printed material enclosed to the Bureau with the Departmental memorandum has been made available to the Laboratory Division for evaluation but is not of sufficient quality for reproduction.

Houston should immediately contact [redacted] and thoroughly interview him to obtain specific details of any violations including Fraud By Wire.

Obtain from [redacted] legible copies of all printed material in his possession and furnish same to the Bureau. Determine all information he has relative to the alleged use of a "blue box" to gain entry into Bureau's NCIC.

Promptly report results of interview in report or LHM form without discussing same with your USA's Office. Maintain an additional copy

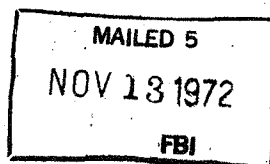
ENCLOSURE

Felt _____
Baker _____
Bishop _____
Callahan _____
Cleveland _____
Conrad _____
Dalbey _____
Gebhardt _____
Jenkins _____
Marshall _____
Miller, E.S. _____
Purvis _____
Soyars _____
Walters _____
Tele. Room _____
Mr. Kinley _____
Mr. Armstrong _____
Ms. Herwig _____
Mrs. Neenan _____

Enclosures (2)

JJC:efg
(6)

ST-102



REC-13

139-4173-1
NOV 14 1972

54 NOV 1972

MAIL ROOM ☐ TELETYPE UNIT ☐

Airtel to SAC, Houston

**Re: Unknown Subjects; Alleged Interceptions of Communications
of Government Officials**

**for possible future dissemination to that office. The Bureau will
obtain the views of the Department and advise Houston of any additional
investigation to be conducted.**

**In view of the potential import of this matter, your office should
not delay in its interview of**

b6
b7C
b7D

11/9/72

GENERAL INVESTIGATIVE DIVISION

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Attached is a referral from the Criminal Division of the Department for such action as deemed appropriate concerning the manufacture and use of the "blue box" to make free telephone calls. According to the Criminal Division. [REDACTED]

[REDACTED] states the "blue box" is being used to intercept, without detection, telephone calls of high Government officials and that 21 unnamed U. S. Senators have purchased these devices for the purpose of bypassing possible wiretaps. One [REDACTED]

[REDACTED] (believed to be engaged in the manufacture of the "blue box") is alleged to have stated he can get into NCIC through means of a "blue box." Similar allegations relative to access to NCIC have been made in the past and disproven.

It is suggested this be directed to the Computer Systems Division and Laboratory Division for evaluation and comment. The General Investigative Division is having Patterson interviewed for further specifics in order to secure the Bureau's interests.

We are checking Bureau files for any pertinent identifiable information on the persons mentioned in the attached.

WAF:DC

RECEIVED
NOV 13 1972
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WAF
UGC
C/S

UNITED STATES GOVERNMENT

DEPARTMENT OF JUSTICE

Memorandum

TO : Acting Director
Federal Bureau of Investigation

DATE: November 8, 1972

FROM : Henry E. Petersen
Assistant Attorney General
Criminal Division

HEP:CWB:JLW:km
177-012

SUBJECT: Individual
Alleged interceptions of the
communications of Government
officials

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On October 11, 1972, Mr. James L. Whitten of the Criminal Division, while in Houston, Texas, conducting an unrelated grand jury investigation, was contacted by a [redacted] of Houston, Texas.

[redacted] stated that [redacted]

[redacted] in an effort to combat the manufacture and use of blue boxes to make free telephone calls. According to [redacted] his work brought him into contact with three persons engaged in the manufacture of blue boxes.

[redacted] informed Mr. Whitten that according to these three individuals, 21 unnamed U. S. Senators have purchased blue boxes for the purpose of bypassing possible wiretaps. [redacted] went on to say that these three individuals, or the people they were working with, were also using blue boxes to intercept, without the possibility of detection, the telephone calls of high Government officials. Finally, [redacted] is supposed to have stated that he can get into the NCIC through means of a blue box. [redacted] himself claimed that it is technically feasible to use a blue box to intercept telephone calls without any possibility of being detected.

Attached are materials turned over to Mr. Whitten by [redacted]

These

Mr. Felt
Mr. Baker
Mr. Bates
Mr. Callahan
Mr. Cleveland
Mr. Conrad
Mr. Dalbey
Mr. Jenkins
Mr. Marshall
Mr. Miller, E.S.
Mr. Ponder
Mr. Soyars
Mr. Walters
Tele. Room

COMB

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ENCLOSURE

ENCLOSURE ATTACHED

REC-96

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EXP. PROC.

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materials include a copy of an article from Ramparts magazine giving directions on how to construct and use a blue box, an article from an unidentifiable magazine discussing the problem in general, an article from a Youth International Party magazine on how to construct and use a blue box [REDACTED]

and an excerpt from ~~Esquire~~ magazine of October (year *noted* unknown) [REDACTED]

These materials and information are submitted for such action as you may deem appropriate. We have no reason to believe that there is any substance to [REDACTED] allegations, but [REDACTED] does appear to be generally reliable. [REDACTED]

[REDACTED] Further, [REDACTED] appears to have a substantial technical background in electronics and communications.

b6
b7C
b7D

Attachments

293
600



ENCLOSURE

139-4173-2

Article ~~X~~ Beating the ~~X~~ blue-box bandits

The answer to any system defrauding seems clear—vigorous prosecution and greater engineering and moral responsibility

Marce Eleccion Staff Writer

As if the telephone utilities didn't have enough to worry about, it seems that a new breed of defrauder has emerged over the past decade to criminally intrude upon a particularly vital part of the telephone system—the toll network. Armed with hardware that ranges from the shoddiest of devices to the newest in integrated circuitry, these "phone phreaks" are able to call virtually around the world via the telephone network—without paying. The methods that are currently being used exploit an unfortunate vulnerability that exists in the present toll dialing telephone system: the inclusion of control

signaling within the voice-frequency band.*

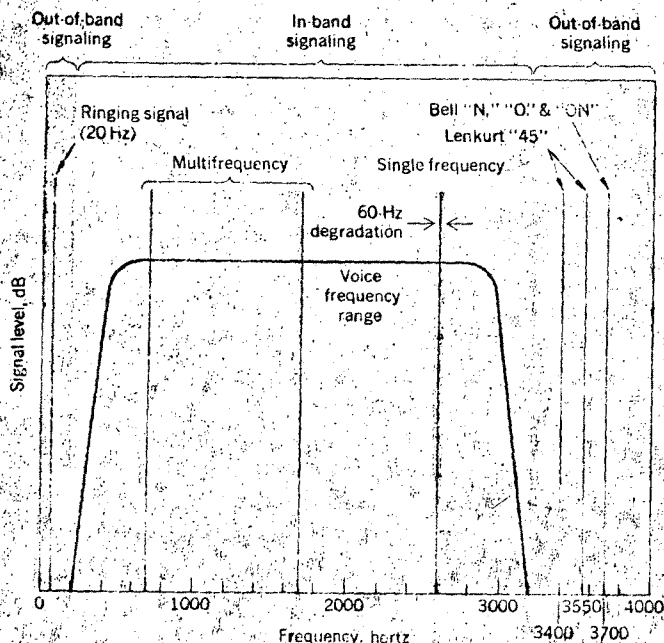
What is basically causing concern among the telephone utilities is the fact that the single-frequency (SF) and multifrequency (MF) toll-traffic signaling tones, which are presently being carried within the voice transmission band (see Fig. 1), can be generated directly from the more than 100 million telephone instruments within the easy grasp of practically the entire U.S. populace. Although the economic and technological considerations that led to the eventual decision to install such a system (see box on dialing and the telephone network) a few decades ago may have been justified at the time, the telephone companies are now beginning to regret ever having opted for such an obviously fallible method of toll signaling.

The problem, of course, arises when individuals out to beat the phone system attempt to initiate SF and MF signaling on their own, thus preempting the role of the toll operator who normally directs these network control signals. The device that these defrauders (who, like most criminal elements, represent only a small percentage of the population) use is called a "blue box," supposedly because the first such unit discovered was that color (and also to differentiate it from black boxes, cheese boxes, etc.). Essentially a tone generator, the "blue box" has been found in all forms, shapes, and disguises (some even designed to self-destruct). The only unit that this writer has seen (at AT&T) was clandestinely constructed in a Navy shipyard and represented magnificent craftsmanship on the part of the builder—a somewhat dubious tribute to the ingenuity of some of these phone defrauders.

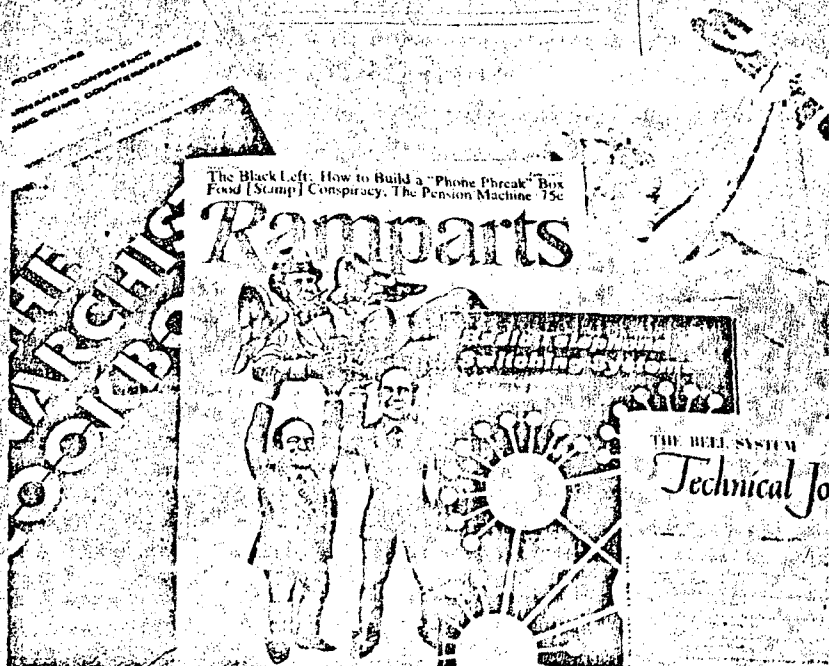
Actually, this type of phone phreak—the MFer or blue-boxer—belongs to a larger category of telephone defrauders (see box, page 53), all practitioners in the art of "ripping off" the phone companies. In the recent literature publicizing these "phone phrauds" (a more accurate epithet), the implication is that they are a loosely organized but glamorous camaraderie. Nothing could be

* Ironically enough, the basic concepts of this transmission method were divulged by the largest of the telephone utilities, AT&T, in a paper that appeared some years ago in the *Bell System Technical Journal*.

[1] In-band and out-of-band signaling frequencies in the telephone network.



COMMUNICATIONS



The cause of growing concern on the part of the telephone companies, the phone phreak's "five-foot bookshelf" is beginning to fill in from the most unexpected sources.

further from the truth! Rather than the antiestablishment avant-garde these defrauders pretend to be, they are in essence violators of the public faith, since their crime is directed at the telephone community as a whole—the user as well as the carrier.

Certainly, such sobriquets as Captain Crunch, Dr. No, The Snark, and Midnight Skulker contribute a colorful image to these supposed modern-day Robin Hoods. When one considers the fate that befalls them, however, the color begins to fade. Captain Crunch (derived from the whistle found in the breakfast cereal of the same name that generated 2600 Hz, a traffic-signaling tone), one of the original phone phrauds, was recently arrested

by the FBI and faces prosecution under Federal statutes. Individuals said to have built fraud devices for elements of organized crime have either disappeared or died violently—a serious deterrent to those contemplating making such devices for others.

The extent of phone defrauding

Although the increase of overall phone fraud since 1965 has been estimated as high as 700 percent, there are indications that the phone companies are beginning to win the battle against offenders, mainly because of an aggressive toll-fraud program they were wise enough to institute early in 1971 and the development of highly

Boxes galore

"Blue box," "cheese box," "black box," and "mute box" describe some of the devices that phone phrauds have used to cheat the telephone companies. They go beyond the cruder defrauding tactics of "box stuffing" and outright coin-box tampering. The cheese box, one of the earliest devices, was often used by bookmakers to conceal their illegitimate operation. It worked by connecting two phones in such a manner as to redirect all incoming calls to a second remote phone; when the authorities located the first phone, they found they were dis-

connected from the real culprit. The black box (also known as the mute box, among other names) enables the user to receive free incoming calls. This method, involving circuit modifications to defeat toll billing, was the subject of a recent article in Ramparts; the issue was recalled since it was in obvious violation of the California Penal Code (see tinted box, p. 57).

By any name, the boxes just described can be called by a single adjective—illegal—and the penalties for their use by another—severe!

effective and sophisticated detection techniques.

In the area of fraudulent credit-card and third-number calls (billings to a third number at the calling party's request), the Bell System has succeeded in halting a spiraling trend in revenue losses, as can be seen in the following:

Year	Credit-Card and Third-Number Fraud
1968	\$ 3.5 million
1969	6.9 million
1970	28.3 million
1971	22.2 million

Not only were revenue losses appreciably reduced in 1971 but there was a marked increase in prosecution—330 arrests and 255 convictions (with many cases still pending in the courts)—as compared with 215 arrests and 207 convictions in 1970.

Another area where losses have been substantially reduced is coin telephone larceny. In 1967, Bell System losses from this type of crime reached an all-time peak of \$3.5 million, which includes equipment damage and destruction. By 1971, these types of losses were reduced to about \$2 million, which was largely due to widespread use of armored coin telephones with sophisticated locks, metal-clad cables, heavy-duty dials and handsets, and single-slot coin telephones that detect and resist "stuffing" as well as slugs.

Unfortunately, the losses that are sustained due to blue-box toll frauds are difficult to estimate. Bell representatives have been quoted at a conservative figure of between \$50,000 and \$100,000 a year, but independent telephone company representatives give estimates as high as \$150 million. The arrest and conviction record is a little more encouraging; although there were only six arrests and two convictions in 1970, there were 45 arrests and 35 convictions (cases still pending) in 1971.

Although the extent of blue-box activities has been thought to be somewhat restricted, the recent experience of a few Bell Laboratories investigators may prove to be a more accurate indicator of the numbers that are actually involved. In visiting a large eastern engineering school to query three students who were active MFers, the Bell group was informed that approximately 100 blue-box devices were in use at this one school alone!

If one can believe the literature, the ramifications of blue-boxing exceed the ability to just make free calls. According to at least one source, phone phrads are also able to intrude upon the privacy of time-shared computer banks that are accessed through the common carriers. In querying the director of engineering of a major software corporation, this writer was informed that it is indeed possible to do so, especially if one learns the control format of a particular system as a former or present user of the computing service. However, even if an intruder is able to breach the top two levels of security, there are additional levels within the file system itself that are known only to the user himself, making it an exceedingly difficult feat to achieve actual intrusion. As if that weren't enough, truly critical data can be stored in a scrambled format, with the chances of deciphering the algorithm scheme virtually nonexistent.

Given the undaunted spirit of a resourceful intruder, however, it is feasible that he will continue his attempts at cracking the code. If this happens, the abnormal access condition is easily detected by error-signal analysis

and corrective measures may be taken by the computer firm. In addition, any line access to a computer port must be accompanied by suitable signaling conditions or it will be shut off; hence a phone phraud must also be in possession of expensive data equipment. Of course, the use of leased lines and fully dedicated file areas preempts any nonphysical access to a computer bank.

Another blue-box intrusion that has been reported is that of wire tapping. The truth of this claim seems in doubt, however, although it is possible for a verification operator using a verification trunk to intrude upon a subscriber's phone conversation in an emergency, a situation many readers may have experienced.

Other blue-box variations that have been speculated upon include the more expensive telephone-answering devices that can be queried for messages remotely by the user after signaling with a tone blast. Without direct information, however, the chances of selecting a single or multifrequency tone from the telephone transmission bandwidth of 200–3200 Hz are pretty slim.

Detection, apprehension, and prosecution

Not surprisingly, the detection methods that are being employed by the telephone companies are not being divulged to the general public (this writer included). An area of obvious great importance, the detection of any criminal activity is dependent on many factors: defrauder error, suspicion based on calculated hunches or calling patterns, billing analysis, or even informants.

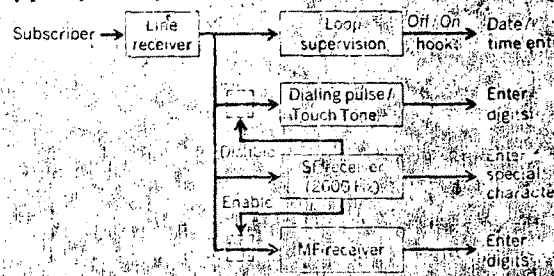
Specific and extremely specialized equipment may also be used, such as that needed for SF/MF detection on a telephone line. What this device does is detect the presence of an unusually long burst of 2600 Hz on a line and trip a counter that records the length of the call, as well as other data. A system that employs this method could operate as described in Fig. 2.* Here, a supervisory circuit detects the off- and on-hook conditions of the telephone and stamps a date and time entry on a recording strip. The equipment then records the legitimate toll number that is dialed (usually a charge-free number), the SF and MF signals illegally entered onto the line, and the conclusion of the call.

According to Bell Labs experts, the SF/MF method of evidence gathering is only one of a great number of detection tools that are at the disposal of security and law-enforcement agencies, with many techniques displaying a high degree of sophistication.

The countermeasures problem confronting today's

* Northeast Electronics Corporation, Concord, N.H.

[2] Simplified system for SF/MF signal processing



Multifrequency dialing and the telephone network

The growth of the telephone communication system is one of the great modern success stories. The simple procedure of dialing a 7-13-digit number and talking across continents has become so commonplace that one forgets the complexity of the system itself.

An idea of the basic elements involved in the switching network comprising the direct distance dialing (DDD) system of North America can be seen in Fig. A. Basic to this system are the up to 10^4 subscribers who may be located within one central (end or exchange) office of a local area. It is through these central offices that a user is automatically switched to the high-usage intertoll routes that complete a toll call; such trunks use toll cables, coaxial cables, and point-to-point microwave transmission. Overseas connections can be made through submarine cables, satellites, and radio transmission.

The rapid growth of telephone usage in the United States alone can be seen from a comparison of the statistics over the decade from 1959 to 1968. During that period, telephones in use increased 55 percent (from 66.6 million to 103.8 million). By comparison, the world increase for this period was 78 percent (from 124.8 million to 222.4 million). In 1968, there were a total of 22 000 central offices in the United States. Given a theoretical 10^4 subscribers for each exchange, the theoretical capacity in that year was over 200 million instruments.

Technical improvements have been made in the telephone instrument itself. Originating with the early magneto/local-battery system in which the

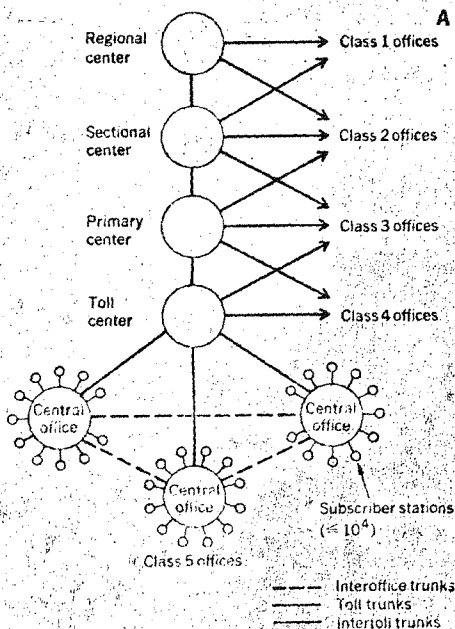
call was completed by a switchboard operator, this device underwent a radical change with the introduction of the rotary dial in 1895. With this dialing system, it became possible to dial a number directly by generating a pulsed dc digit. The most recent innovation—and the one that eventually led to the present phone-phreaking problem—is key-pulse or pushbutton dialing, which had been used for toll and dial service assistance (DSA) switchboards for a number of years but was withheld from consumer use because of voice-interference problems that existed.

Operating with multifrequency tone keying using ac pulses (opening the way to newer services such as computers), the pushbutton system (Fig. B) utilizes eight frequencies within the voice band (different from the six toll-traffic signals) over a 16 button format (only 12 are actually used for AT&T's Touch Tone® telephone sets). Initiation of such fast (any digit can be transmitted in the same time it takes for transmitting "1" on a rotary dial) and accurate number generation was deemed a necessity because of the increased telephone traffic and the higher speeds of future electronic switching systems.

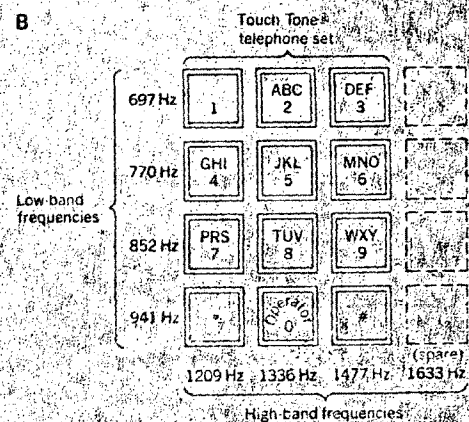
At the present time, electronic switching systems (ESS) serve only a small percentage of the U.S. telephone network, with direct-control and common-control electromechanical switching systems serving most of it. It is projected, however, that every central exchange in the U.S. will have electronic equipment by the year 2000.

Since the blue-box problem has come about as a result of the inclusion of multifrequency toll signals within the voice transmission band, the question naturally arises: "Why not separate the two?" The answer is that such a solution is already being worked on, but will require both time and large expenditures of money to implement in a system as large as the telephone network. Meanwhile, the problem must be approached in the ways described within this article.

Elements of a telephone network.



Pushbutton dialing frequencies.



Powers on fraud

There's no doubt that there's a problem with fraud in most large systems in the country today, whether they're telephone networks or computer networks or whatever. We've been concerned about fraud in the Bell system from many points of view for many years, originating with the very coarse, gross kinds of fraud, if you like, of people billing calls to telephone numbers that aren't theirs (say to your home phone number or to your credit-card account number) or the strong-arm kind of business where someone takes a coin telephone box and breaks it open. I'm not making too much of a distinction between vandalism per se and fraud per se. I'm thinking only about ways in which people manipulate the system in order to escape the legal obligations to pay for the services that they're provided.

Since basic telephone services are paid for by the great mass of consumers through tariffs approved by the State utility commissions and by the Federal Communications Commission, someone pays for every call. If the person who makes that call doesn't pay for it, then the net result is a slight increase in the average cost of calls made by all the honest customers.

The primary question is: Do the people who get the service pay for the service?

We talk blithely and with sincerity about the older people on pensions who pay telephone bills every month just as we do. And there are a lot of people like that, including, perhaps, our parents, and anything that makes the cost of local service go up tends

to work to their disadvantage. That's one of our concerns.

We do view fraud as a problem. People have grown more sophisticated, more information on our system has been published (and we ourselves published a great deal of it in the past), college students and others have been able to take advantage of electronics, which many *Spectrum* readers, including me, have helped to bring into being. Things like integrated circuits and transistors now exist, leading to a much higher level of sophistication in circuitry than was extant in the country perhaps two decades ago. Certainly then, people have become much more clever at working the system in fraudulent manners.

And so the problem is growing. But at this time, it's not a problem that's about to sink the telephone utilities, by any means. We have many projects here at the Bell Labs and there are many in the Bell System that are occupying a lot more of our time and money and effort.

It certainly is not insignificant either. It's not at all trivial; we are concerned about it. AT&T of course is carrying the burden from the point of view of legal remedies to the problem—the apprehension and prosecution of people who are involved in defrauding the telephone companies—and in providing the systems consideration and direction to our development efforts.

Tom Powers
Director, Telephone Laboratory
Bell Telephone Labs, Holmdel, N.J.

telephone utility are enormous, especially with the increased availability of modern electronics gadgetry (see "Powers on Fraud," above). Tom Powers of Bell Labs has summed it up in this way:

"Whenever information as to how a system is intended to work comes out in any fashion, a few people very quickly find a way around it. It seems that, no matter how smart we are, it doesn't take long until someone figures out a way to break the code and the losses start going up again. . . . We're very much concerned about tipping our hand and giving away the combination to the safe."

The temptation to defeat the phone system at this counter-countermeasure game may seem irresistible to some; if so, they would be wise to consider both the penalties that must be exacted and the undaunted resolution of the phone companies. Joe F. Doherty, director of corporate security for AT&T, has stated his position in prosecuting phone defrauders most unequivocally:

"We are prosecuting aggressively and without any exception. We have a Federal felony statute, we would like felony laws in every state, in addition to existing laws that make fraud a violation that is other than just a misdemeanor. . . . We're getting more interest out of the FBI and we're getting more felony prosecutions. So when these people are convicted of a Federal felony, they've got the stigma for the rest of their life."

What Mr. Doherty was referring to was Title 18 of the United States Code, specifically paragraph 1343 en-

titled "Fraud by Wire, Radio or Television." (See box, p. 57.) The wording of the pertinent sections of this statute may seem like legalese to some, but the meaning of the penalties for those prosecuted for this type of fraud come through loud and clear—a fine of "not more than \$1000," imprisonment for "not more than five years," or both! (Earlier Federal statutes that attempted to control fraud in the communications field included Section 605 of the 1934 Federal Communications Act (Title 47, U.S.C.), which was entitled "Unauthorized Publication or Use of Communications.")

The untied box on page 57 contains several excerpts from the Federal criminal code and various state penal codes dealing with wire fraud. It should be emphasized that, even though only about half of the states specifically proscribe the possession and/or use of phone fraud devices, the Federal statutes, which are much stronger than most existing state laws, provide an effective and forceful means of dealing with this type of fraud. Such federal jurisdiction brings with it an exemption to extradition procedures, reduced evidential problems, and of course the threat of surveillance and eventual apprehension by the FBI.

Concerning the actual printing of written material advocating (as some of the more nonconformist magazines and underground newspapers have been doing with increasing frequency) the defrauding of telephone companies, the statutes that have been passed in California, Georgia, Kansas, Maryland, and Virginia (Gov-

Title 18, United States Code (1952 Edition)

§1343. Fraud by Wire, Radio, or Television

Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations, or promises, transmits or causes to be transmitted by means of

wire, radio, or television communication in interstate or foreign commerce, any writings, signs, signals, pictures, or sounds for the purpose of executing such scheme or artifice, shall be fined not more than \$1000 or imprisoned not more than five years, or both.

California Penal Code (1965 Cum. Supp.)

§502.7. Obtaining Telephone or Telegraph Services by Fraud

(a) A person who, knowingly, willfully and with intent to defraud a person providing telephone or telegraph service, avoids or attempts to avoid, or aids, abets or causes another to avoid the lawful charge, in whole or in part, for telephone or telegraph service by any of the following means is guilty of a misdemeanor:

(1) By charging such service to an existing telephone number or credit card number without the authority of the subscriber; ...; or

(2) By charging such service to a nonexistent telephone number or credit card number, ...; or

(3) By use of a code, prearranged scheme, or other similar stratagem or device whereby said person, in effect, sends or receives information; or

(4) By rearranging, tampering with, or making connection with telephone or telegraph facilities or equipment, whether physically, electrically, acoustically, inductively, or otherwise, ...; or

(5) By using any other deception, false pretense, trick, scheme, device or means.

(b) A person who (1) makes, possesses, sells, gives or otherwise transfers to another, or offers or advertises an instrument, apparatus or device with intent to use it with knowledge or reason to believe it is intended to be used to avoid any lawful telephone or telegraph toll charge; ...; or (2) sells, gives or otherwise transfers to another or offers or advertises plans or instructions for making or assembling an instrument, apparatus or device described in paragraph (1) of this subdivision with

knowledge or reason to believe that they may be used to make or assemble such instrument, apparatus or device, is guilty of a misdemeanor.

(c) If the total value of all telephone or telegraph services in violation of this section aggregates over \$200 within any period of 12 consecutive months during the three years immediately prior to the time the indictment is found, ... a person guilty of such offense is punishable by imprisonment in the state prison not exceeding five years, or by imprisonment in the county jail not exceeding one year, or by fine not exceeding \$5000, or by both such fine and imprisonment.

§640. Wire Tapping; Use of Information; Conspiracy; Punishment

A person who, by means of any machine, instrument, or contrivance, or in any other manner, willfully and fraudulently, or clandestinely taps, or makes any unauthorized connection, whether physically, electrically, acoustically, inductively, or otherwise, with any telegraph or telephone wire, line, cable, or instrument under the control of any telegraph or telephone company; ... or in any unauthorized manner, reads, or attempts to read, or to learn the contents or meaning of any message, report, or communication while the same is in transit or passing over any telegraph or telephone wire, line, or cable, ... is punishable by imprisonment in the state prison not exceeding five years, or imprisonment in the county jail not exceeding one year, or by fine not exceeding \$5000, or by both such fine and imprisonment.

Arkansas Statutes (1947 Annotated): Title 41—Criminal Offenses

§41-1956. Telecommunications—Obtaining Service with Intent to Defraud—Prohibited Acts

Any individual, corporation, or other person, who, with intent to defraud or to aid and abet another to defraud any individual, corporation, or other person, of the lawful charge, in whole or in part, for any telecommunications service, ... by any of the following means may be penalized as provided in §41-1959 of this act:

(a) By charging such service to an existing telephone number or credit card number without the authority of the subscriber; ...; or

(b) By charging such service to a nonexistent, false, fictitious, or counterfeit telephone number or credit card number, or to a suspended, terminated, or otherwise unavailable telephone number or credit card number; ...; or

(c) By use of a code, prearranged scheme, or other similar stratagem or device whereby said person, in effect, sends or receives information, or

(d) By installing, rearranging, or tampering with any facilities or equipment, whether physically, inductively, acoustically, electronically, or otherwise; ...; or

(e) By any other trick, stratagem, impersonation, false pretense, false representation, false statement, contrivance, device, or means.

§41-1959. Penalty for Fraudulently Obtaining Telecommunications Service

Any person violating the provisions of §41-1956 of this Act shall be guilty of a misdemeanor and upon conviction shall be subject to a fine of not more than \$100 or imprisonment for not more than 30 days if the amount of the telecommunications service obtained by such use does not exceed \$25, or by a fine of not less than \$50 or not more than \$100 or imprisonment for not more than 30 days if the amount of the telecommunications service obtained by such use exceeds \$25, or by both such fine and imprisonment.

"Oh, you know. Hello test one two three," he says in a low-pitched voice.

"Hello test one two three," he replies to himself in a high-pitched voice.

"Hello test one two three," he repeats again, low-pitched.

"Hello test one two three," he replies, high-pitched.

"I sometimes do this: Hello hello hello hello, hello, hello," he trails off and breaks into laughter.

Why Captain Crunch Hardly Ever Taps Phones Anymore

Using internal phone-company codes, phone phreaks have learned a simple method for tapping phones. Phone-company operators have in front of them a board that holds verification jacks. It allows them to plug into conversations in case of emergency, to listen in to a line to determine if the line is busy or the circuits are busy. Phone phreaks have learned to beep out the codes which lead them to a verification operator, tell the verification operator they are switchmen from some other area code testing out verification trunks. Once the operator hooks them into the verification trunk, they disappear into the board for all practical purposes, slip unnoticed into any one of the 10,000 to 100,000 numbers in that central office without the verification operator knowing what they're doing, and of course without the two parties to the connection knowing there is a phantom listener present on their line.

Toward the end of my hour-long first conversation with him, I asked the Captain if he ever tapped phones.

"Oh no. I don't do that. I don't think it's right," he told me firmly. "I have the power to do it but I don't. . . Well one time, just one time, I have to admit that I did. There was this girl, Linda, and I wanted to find out . . . you know, I tried to call her up for a date. I had a date with her the last weekend and I thought she liked me. I called her up, man, and her line was busy, and I kept calling and it was still busy. Well, I had just learned about this system of jumping into lines and I said to myself, 'Hmmm. Why not just see if it works. It'll surprise her if all of a sudden I should pop up on her line. It'll impress her, if anything.' So I went ahead and did it. I M-F-ed into the line. My M-F-er is powerful enough when patched directly into the mouthpiece to trigger a verification trunk without using an operator the way the other phone phreaks have to."

"I slipped into the line and there she was talking to another boyfriend. Making sweet talk to him. I didn't make a sound because I was so disgusted. So I waited

kachink cheep, and the complex connection has wiped itself out like the Cheshire cat's smile."

The MF Boogie Blues

The next number I choose from the select list of phone-phreak illuminati prepared for me by the blue-box inventor is a Memphis number. It is the number of Joe Engressia, the first and still, perhaps, the most accomplished blind phone phreak.

Three years ago Engressia was a nine-day wonder in newspapers and magazines all over America because he had been discovered whistling free long-distance connections for fellow students at the University of South Florida. Engressia was born with perfect pitch; he could whistle phone tones better than the phone-company equipment.

Engressia might have gone on whistling in the dark for a few friends for the rest of his life if the phone company hadn't decided to expose him. He was warned, disciplined by the college, and the whole case became public. In the months following media reports of his talent, Engressia began receiving strange calls. There were calls from a group of kids in Los Angeles who could do some very strange things with the quirky General Telephone and Electronics circuitry in L.A. suburbs. There were calls from a group of mostly blind kids in . . . California, who had been doing some interesting experiments with Cap'n Crunch whistles and test loops. There was a group in Seattle, a group in Cambridge, Massachusetts, a few from New York, a few scattered across the country. Some of them had already equipped themselves with cassette and electronic M-F devices. For some of these groups, it was the first time they knew of the others.

The exposure of Engressia was the catalyst that linked the separate phone-phreak centers together. They all called Engressia. They talked to him about what he was doing and what they were doing. And then he told them—the scattered regional centers and lonely independent phone phreakers—about each other, gave them each other's numbers to call, and within a year the scattered phone-phreak centers had grown into a nationwide underground.

Joe Engressia is only twenty-two years old now, but along the phone-phreak network he is the old man, accorded by phone phreaks something of the reverence the phone company bestows on Alexander Graham Bell. He seldom needs to make calls anymore. The phone phreaks all call him and let him know what new tricks, new codes, new techniques they have learned. Every

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INTERNATIONAL TELECOMMUNICATION RECOMMENDATIONS

NOTOC

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ARTICLE

National Circuits on Carrier Systems over Very Short Distances. Assuming that circuits in an international connection, making use of frequency-division-multiplex carrier systems over very short distances, can be limited in number to 4, the mean psophometric power should not exceed 2000 pWp0 per circuit during any hour, including crosstalk.

The CCITT does not yet offer Recommendations for pulse-code-modulation systems. (G.125)

Design Objectives for Noise Produced by Modulating Equipments

The mean psophometric power, which corresponds to the noise produced by all modulating equipment mentioned in the definition of the hypothetical reference circuit in question, should not exceed 2500 pWp0. This value includes noise due to various causes, such as thermal noise, intermodulation, crosstalk, power supplies, etc. Its allocation between the various equipments can be left somewhat to the discretion of designers, but the following values are given as a guide to the target design values.

	pWp0
One pair of channel modulators	200-400
One pair of group modulators	60-100
One pair of supergroup modulators	60-100
One pair of mastergroup modulators	80-120

(G.222, Section d)

CCITT AND TELEGRAPHY

The CCITT Blue Book contains the Recommendations adopted by the Third Plenary Assembly in Geneva, in 1964. The Recommendations on Telegraph Technique are included in Volume VII, and those on Data Transmission are included in Volume VIII. The Recommendations on Telegraph Operations and Tariffs are contained in Volume II of the Red Book and in Documents AP III-64, 65, and 74. The latter (AP III-74) has been importantly revised by CCITT Circular No. 15 in 1964, 12 November 1964 entitled "List of Destination Indicators."

Numbering

There is a worldwide system of Destination Indicators for the telegraph-message retransmission. These indicators consist of two letters identifying the country and its telegraph network (if more than one) followed by two letters signifying the town on that network. Examples: Vienna AUWI, Panama City (Tropical Radio) PAPA, Balboa (ITTCACR) PZBA, Stockholm SWSM, San Francisco (ITT Worldcom) USEF.

The CCITT has approved a worldwide numbering system for telex services. The telex designation code consists of 2 or 3 numerical digits signifying the country or network within the country. The destination code is followed by the telex subscriber's national number, also consisting of numerical digits.

The telex system provides also for designation codes, for identifying the country and network of

TABLE 3—CCITT SIGNALING SYSTEMS.

No.	Systems
1	500/20-hertz system used in the international manual service (ringdown).
2	600/750-hertz 2-frequency system. Never used in international service.
<i>International Automatic and Semi-automatic Systems</i>	
3	For unidirectional operation of circuits. Uses 1 in-band frequency (2280 hertz) for the transmission of both line and interregister signals; used for terminal traffic; in general not to be used for new installations.
4	For unidirectional operation of circuits (circuits seized from one end only). Uses 2 in-band frequencies (2040 and 2400 hertz) for the end-to-end transmission of both line and register signals; used for international intracontinental traffic; suitable for terminal and transit traffic; in the latter case 2 or 3 circuits equipped with System No. 4 may be switched in tandem. Suitable for submarine- or land-cable circuits and microwave radio circuits; not applicable to TASI-equipped systems. Capable of interworking with System No. 5.
5	For both-way operation of circuits. Uses 2 in-band signaling frequencies (2400 and 2600 hertz) for the link-by-link transmission of line signals, and 6 in-band frequencies (700, 900, 1100, 1300, 1500, and 1700 hertz) in a 2-out-of-6 code (numerical information transmitted en bloc) for the link-by-link transmission of register signals; used for intercontinental traffic. Suitable for submarine- or land-cable circuits and microwave links, whether or not TASI is used; suitable for terminal or transit traffic—in the latter case, 2 or more circuits equipped with System No. 5 may be switched in tandem but are subject to possible undesirable delays if all are TASI-equipped. Capable of interworking with System No. 4.
6	A proposed system to be free from some limitations of Systems No. 3, 4, and 5; expected to use voice channel for interregister signaling, plus a separate channel for line signaling and "management" signaling (changing of routing, et cetera); not expected to be in use before 1970.

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the originator of a communication. The designation code consists of two letters, the same two letters that compose the first half of the message-retransmission-system destination indicator.

Examples of destination codes are:

North and Central America: 200 Cuba, 205 Puerto Rico (RCA), 206 Puerto Rico (ITTWC), 207 Puerto Rico (C & W), 21 Canada (except TWX), 22 Mexico, 25 USA (TWX), 271 Guatemala, 275 British Honduras, 290 Bermuda, 292 Virgin Islands.

South America: 304 Surinam, 305 Paraguay, 31 Venezuela, 36 Peru, 381 Brazil (Radio Brazil), 383 Brazil (PTT), 387 Argentina (ITTCM), 390 Netherlands Antilles, 391 Trinidad.

Europe: 400 Canary Islands, 403 Spain, 409 Algeria, 41 Germany, 46 Belgium, 492 Syria, 496 Kuwait, 501 Iceland, 51 United Kingdom, 57 Finland.

Eastern Europe: 601 Greece, 606 Israel, 61 Hungary, 64 USSR, 65 Romania.

Pacific: 702 Guam, 704 Hawaii (RCA), 705 Hawaii (ITTWC), 71 Australia, 72 Japan, 75 Philippines.

Asia: 801 Korea, 802 Hong Kong, 81 India, 85 China, 88 Iran.

Africa: 901 Libya, 907 Southern Rhodesia, 91 United Arab Republic, 94 Ghana, 95 South Africa, 972 Dahomey, 975 Niger, 981 Congo (Brazzaville), 982 Congo (Leopoldville), 991 Angola, 992 Mozambique.

CCITT AND TELEPHONY

International Country Codes

The addressing signals of worldwide automatic telephony consist of the national telephone number, as used for long-distance dialing within a country, prefixed by a country code. Country codes are grouped by continental regions; for example, the country codes of all South American countries begin with "5." Where the national numbering system includes more than one country, the country code may also include the countries included in the national system. Thus the country code for the United States—"1"—includes Canada and some other countries. The following are examples of some country codes, grouped by world numbering regions or zones as assigned by the Third Plenary Assembly of the CCITT in Geneva in 1964.

Zone 1—Code 1: USA, Canada, Mexico and Central America, Bahamas, Bermuda, Jamaica, French Antilles, Netherlands Antilles.

Zone 2—Africa: 51 countries, 48 country codes (Algeria, Morocco, Tunisia, Libya in one group—the Maghreb—code 21). United Arab Republic 20, South Africa 27, 45 three-digit codes.

Zones 3 and 4—Europe: Iceland, Malta, Cyprus: 17 two-digit and 13 three-digit country codes. Examples: France 33, Spain 34, Italy 39, United Kingdom 44, Germany 49, Iceland 354, Finland 401, Hungary 402.

Zone 5—South America and Cuba: 6 two-digit and 8 three-digit country codes. Examples: Cuba 53, Argentina 54, Brazil 55, Chile 56, Colombia 57, Venezuela 58, Peru 596.

Zone 6—Southwestern Pacific: 6 two-digit and 14 three-digit country codes. Examples: Malaysia 60, Australia 61, Indonesia 62, Philippines 63, New Zealand 64, Thailand 66, Guam 682.

Zone 7—Country code 7: Soviet Union.

Zone 8—Northwestern Pacific: 4 two-digit and 6 three-digit country codes. Examples: Japan 81, Korea 82, Vietnam 84, China (Formosa) 85, Hong Kong 852, Mongolia 854, Laos 856.

Zone 9—East: 5 two-digit and 15 three-digit country codes. Examples: India 91, Burma 95, Iran 98, Lebanon 961, Saudi Arabia 966, Israel 972, Nepal 977.

TELEPHONE SIGNALING

CCITT signaling systems have been standardized for international use. General descriptions are

TABLE 5—MULTIFREQUENCY NUMERICAL CODE USED BY CCITT (2-OUT-OF-6).

Digit	Frequencies	Weighting
1	700+900	0+1
2	700+1100	0+2
3	900+1100	1+2
4	700+1300	0+4
5	900+1300	1+4
6	1100+1300	2+4
7	700+1500	0+7
8	900+1500	1+7
9	1100+1500	2+7
0	1300+1500	4+7
Code 11	700+1700	0+11 (for inward
Code 12	900+1700	1+11) operators
KP	1100+1700	2+11 start of pulsing
KP2	1300+1700	4+11 transit traffic
ST	1500+1700	7+11 end of pulsing

TABLE 6—NUMERICAL 4-BY-4 MULTIFREQUENCY CODE.

Touch-Tone or Touch Calling					US Air Force 412L				
Low group (hertz)	1	2	3		Low group (hertz)	1	2	3	
697	1	2	3		1020	4	5	6	
770	4	5	6		1140	7	8	9	
852	7	8	9		1260		0		
941	spare	0	spare		1380				
	1209	1336	1477	(1633) High group (hertz)		1620	1740	1860	(1980) High group (hertz)

Note: Each digit is composed of one frequency from the low group and one frequency from the high group. The frequencies have been chosen to minimize voice simulation.

given in Table 3, and some of the signaling characteristics are given in Table 4.

Signals in communications are used for passing information, for identifying the called subscriber or addressee (with resulting internal system signals concerned with the establishment of a connection), and for supervising and controlling the connection once it has been established.

Information Signals may be analog (voice, telemetry, or facsimile) or digital (teleprinter or data).

Addressing Signals may be dial pulse, multi-frequency, or binary. They are not needed once a communication has been established.

TABLE 7—US ARMY TA-341/PT NUMERICAL CODE.

Digit	Frequencies
1	2100+2300
2	2300+2500
3	1900+2700
4	1900+2100
5	2500+2700
6	2300+2700
7	2100+2500
8	1900+2300
9	2100+2700
0	1900+2500

(A) Dial Pulse signals consist of a series of from 1 to 10 pulses representing the corresponding numerical digits 1 to 9 and 0. The pulses are breaks in a continuous direct current on the line, usually lasting from 58 to 67 percent of the time interval between the starts of successive pulses. These breaks in direct current may have to be converted into pulses in a tone, or to frequency

TABLE 8—NUMERICAL CODE, 2-VOICE-FREQUENCY SIGNALING SYSTEM, CCITT No. 4.

Digit	Successive Elements			
	1	2	3	4
1	y	y	y	x
2	x	y	x	y
3	y	y	x	x
4	y	x	y	y
5	y	x	y	x
6	y	x	x	y
7	y	x	x	x
8	x	y	y	y
9	x	y	y	x
0	x	y	x	y

Note: The 2 frequencies are sent one at a time, with a silent space between pulses. The duration of both frequency and silent periods is 35 ± 7 milliseconds. Frequencies: $x = 2040 \pm 6$ hertz; $y = 2400 \pm 6$ hertz. Power level: -9 decibels.

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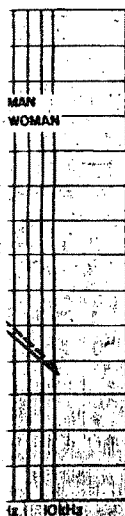
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BASIC PRINCIPLES OF SOUND

13

garded as duplicating the basic musical import of the other tone at the nearest possible higher pitch. An interval in octaves, between any two frequencies, is the logarithm to the base two (or 3.322 times the logarithm to the base 10) of the frequency ratio. The frequency ratio corresponding to an octave pitch interval is approximately, but not always exactly, 2:1.

1.27 What is a semitone, or half-step?—The same as a half-tone or any interval between two tones equal to the 12th root of 2.

1.28 What is a tone?—A sound wave capable of exciting an auditory sensation and having pitch. A sound sensation having pitch.

1.29 What is a chromatic scale?—A musical scale in which the intervals are all half-tones or semitones.

1.30 What is a scale of equal tem-

perament?—A musical scale divided into twelve intervals. It is obtained by alternating the tones from the exact frequency of just intonation as a result of reducing the number of tones per octave.

These frequency ratios are 1, F, F₁, F₂, F₃ . . . to F₁₂, where F is the 12th root of 2 and F₁₂ equals 2. The scale consists of 12 equal intervals, including half-tones. In Fig. 1-30 is shown the keyboard of a conventional 88-note piano with the tones indicated in hertz. A (440 Hz) is designated A₄ and the octaves above A₄ are designated A₅, A₆, and A₇. The octaves below A₄ are designated A₃, A₂, A₁, and A₀. The lowest frequency is A₀ or 27.5 Hz. The highest frequency is C₈, or 4186 Hz. The interval between the black and white keys is 100-cents, or an equally tempered semitone. (See Question 1.31.)

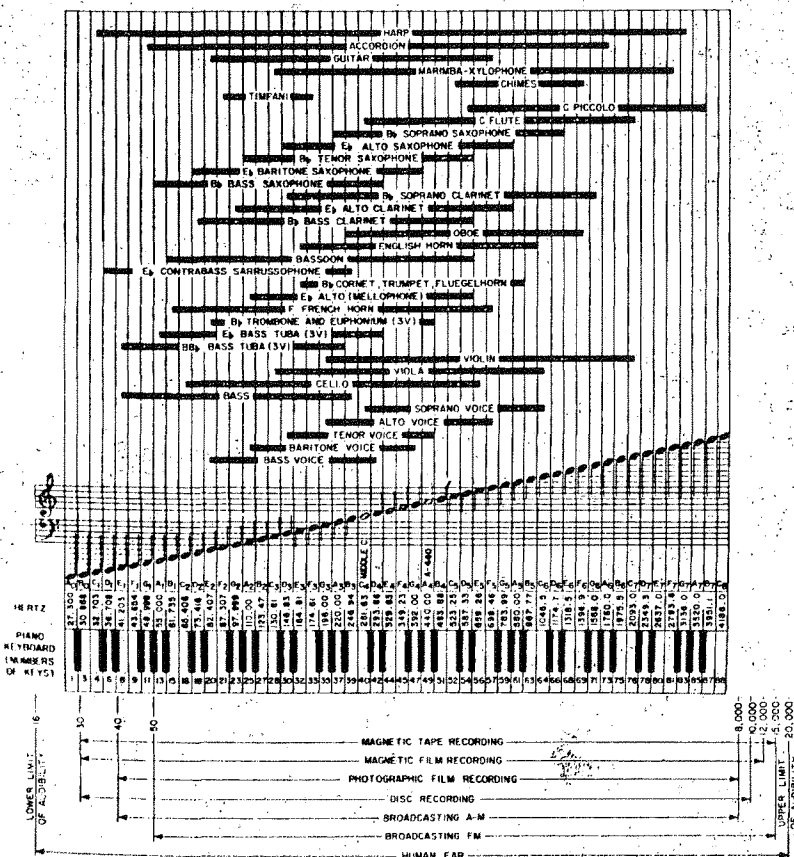


Fig. 1-30. Conventional 88-note piano keyboard showing the note designations and frequency. The audio frequency range of recording and broadcasting stations has been entered for comparison.

THE YOUTH INTERNATIONAL PARTY LINE

MO 12 AUGUST 1972



NEW READERS!

If you're a new reader, you might be wondering just what the hell this is all about. YIPL is an anti-profit organization dedicated to people's technology, and we publish information that shows you how to fight back at the computers that run our lives. Every YIPL reader is urged to be a contributing editor, and to send us ideas for stories, information from the inside, and criticism of what we do or don't publish. We're taking a big risk so help us make it worthwhile. Get as many people to join as possible, and help spread the ideas you learn from YIPL.

If you got this as a sample issue, a subscription is \$2/year. If you're poor and can't afford it, it's free. So if you can afford it, perhaps you can afford to help pay for some less fortunate person's share. Send stamps or checks but no cash please. We're getting ripped up mail all the time.

There's been a lot of talk about the Red Box, and we promised to reveal just what it is. The Red Box is only

single shot pay phone. Circuits will soon be available.

5-60 ms. pulse.

10-20 ms. on, 10-20 ms. off, 10-20 ms. on

25-5 pulses; 10 ms. on, 10 ms. off

The Phone Phreak Convention on July 29 in New York was interesting indeed. Many phreaks, men, phreaks, and even a few undercover agents from the Phone Company attended. They watched a film about tapping off the phone company, ate Bell cookies, discussed in workshops about circuits, legal questions, general strategies of the Bell. We'll be going forward to the next convention. Soon, see ya there!

By the way, the film is available for rent, so write to us.

John Thomas Draper, the alleged Captain Crunch of Esquire fame, is about to go on trial in California. The charge is fraud by wire, but the motive behind the indictment is to intimidate every phone phreak in the country and to silence John, who they suspect knows enough to turn them into a pile of rubble. John's lawyer, Jim McMillan, are both good dudes but they need money to fight this bullshit. If you can, please send some bread to the Captain Crunch Defense Fund, Box 755, Campbell, CA 95008, or to the same c/o 310 W. 504, 152 W. 42 St., NY, NY 10011.

RAM PARTS INFO

Last month we published a simplified version of the suppressed Ramparts article "Regulating the Phone Company in your home" and we have heard that a new, experimental system will detect the device being used in 10 minutes in certain locations in New York. This is not confirmed but it really isn't bad news because once you can use the device 10 times in a

rumor is checked out. The plan is to get all calls under 4 minutes to or from the New York area. All Telco employees should be aware of this. About 100 calls to us soon.

CONSTRUCTION

The Blue Box uses two tones per digit. We know the oscillator and a common amplifier.

and one for the amplifier. So diodes are used, or an on-off switch on the amp lets you use only 24 matched silicon. The best speaker is a telephone earpiece. Each tone mixes thru a 47K resistor. 50K sets min. lattice current drain under 10 milliamperes.

Oscillator frequency $= 1/2\pi\sqrt{LC}$ when the R/2 is in parallel to the power of oscillation. This point has no distortion, and the frequency can be raised, but distortion sets in. For 1500 cycles, and C .0022, R about 45kohms. Raising R to 17K (the next highest standard value) lowers the frequency, and you can now tune up to 1500 Hz. Raising R will be very low. 2C will be .001, and R/2 will be 22K, use a 50K. With appropriate 152 capacitors, 152K. 2600 Hz oscillation is really good. Try it!

To simplify the diode jungle, use a matrix by sandwiching the diodes between two pieces of perforated circuit board, one with 15 "bus" lines in the switches and the other with 15 input lines. The oscillators and diodes are on the amplifier. Actually, since 2600 is a single tone, you don't need a diode for each matrix. Can be 15K. The diodes are oriented inside the two boards. Watch polarity.

Readers have reported that an integrated circuit exists that used a resistor for each tone, two variable oscillators being required for a box. The Signetics 566 is also reported to be unstable with temperature variations. For plans on building with it, write to Signetics, 11 E. Arques Ave., Sunnyvale, CA 94086 and ask for information on the 566 VCO and applications notes. Sign your name Joe Smith, Eng.

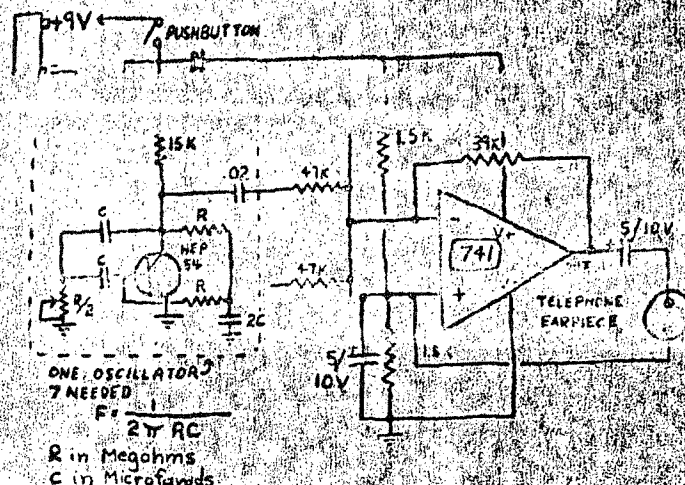
TUNING

Notes on an organ will actually work if

you have a box, a 2600 Hz oscillator, and a source of 1.5V and adjust. All "tunes" just stop. Remember there are two tones per digit. If you tune with an organ, you must be able to interpolate, that is, to set the pitch in between two different organ notes. To set the 400 Hz oscillator, it should be between the A and the B.

OPERATION

From a pay phone, dial long distance information, or a 300 number, whichever you can get from your city. As call goes thru, press 2600 for one second, and when you hear a click dial desired number, preceded by 12 and followed by 51. Example: 12-1568-51. Each pulse is the same, as if you were using a pushbutton phone. All pulses must be sent within 10 seconds of disconnect, if not, disconnect and try again. Do not talk, no longer than necessary.



741 OP AMP available at Twy Park, Box 9321, San Jose, CA 95108. Order 741C, 10-5 each, 2 for 90¢, and 25 for postage and sales. Write for catalog first as the many requirements are listed. All resistors 1/4 watt, 5%. Capacitors recommended Sprague 100P, silvered mica, or micas (diphenyl).

The values of R should be between 30K & 150K.

Hep 51, 2P22Z, or RCA 6K3020 transistors. Diodes: matched small signal silicon (1N914).

741 OP AMP - TOP VIEW



Note	Frequency
1	600-900
2	900-1100
3	900-1100
4	700-1300
5	900-1300
6	1100-1500
7	700-1500
8	900-1500
9	1100-1500
0	1300-1500
KH	1100-1500
51	1500-1700

Disconnect 2600

Note Frequency

F4	698
A5	880
C5	1100
F5	1310
F5	1310
G5	1661
F6	2632

A 16 button keyboard with no moving parts, 16 buttons, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2, 1/2.

price is \$7.95. It is available in a catalog before you order it. Also, if any readers know where to obtain a 16 button keyboard, please let us know details. By the way, 16 buttons is perfect for a combination blue box/red box.

line earpiece with 1000 ohm probe. It is a 1000 ohm probe. The smartest phone people know, called carry their talk with them, but they are not to be trusted, when they are after their call. All numbers directly dialable are callable with the box. Overseas instructions will be forthcoming.

HOW IT WORKS

When you dial a long distance number, the signal goes to your local CO. From there your call is switched to another CO in the same area, meaning a local call, or it is switched to a toll office. Toll office is a switchboard which is in charge of toll calls. It is the toll office which sends the signal to the toll office in the area you are calling.

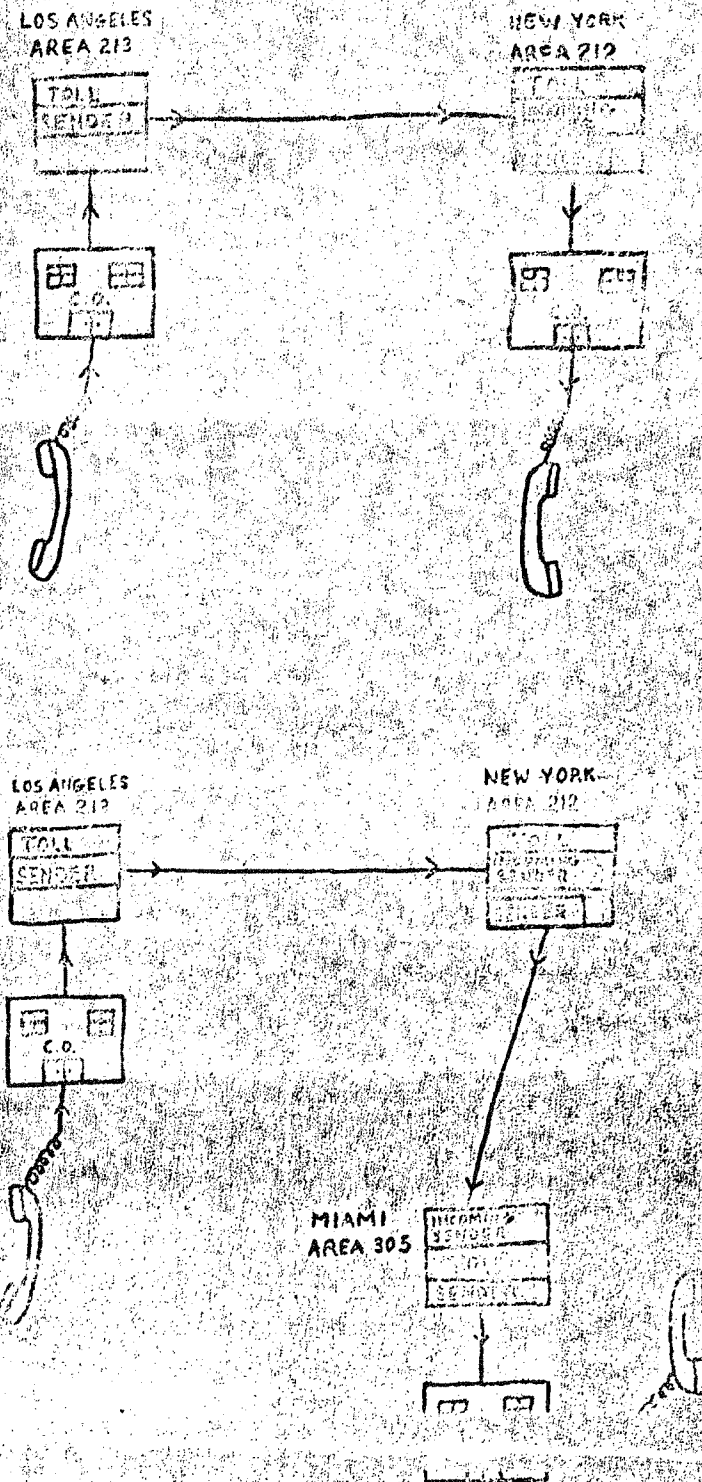
When the toll office in the area you are calling happens to be busy, the digits you dialed are stored in a memory bank. The toll office then sends a signal to the toll office in the area you are calling. The toll office in the area you are calling then sends a signal to the toll office in the area you are calling. The toll office in the area you are calling then sends a signal to the toll office in the area you are calling.

When the toll office in the area you are calling sends a signal to the toll office in the area you are calling, the toll office in the area you are calling then sends a signal to the toll office in the area you are calling. The toll office in the area you are calling then sends a signal to the toll office in the area you are calling. The toll office in the area you are calling then sends a signal to the toll office in the area you are calling.

Control of your telephone line is done by you. When you hang up, the CO relays that to the senders and incoming senders on the trunk and then they disconnect. If, however, you were to send a 2400 cycle condition on your line, your CO would not do anything because it isn't designed to react to a 2400 cycle condition. If the inter-toll trunks would think you hung up because 2400 cycles means the line is idle. So they would disconnect you from the CO at the other end of the chain when you release the 2400 cycle condition. The CO at the other end would now be in a state of "idle" and wait for the next call.

When you hang up, the CO (your) the CMA is billing you for the initial call you made. If it was for information, the rate is zero c/min. However, information calls don't take too long so the people who cover the paper tape at the end of the line are a different group. But it is better to wait. The Miami group 2400 cycles are passing thru the CO at the other end of the chain. When you hang up, the CO (your) the CMA is billing you for the initial call you made. If it was for information, the rate is zero c/min. However, information calls don't take too long so the people who cover the paper tape at the end of the line are a different group. But it is better to wait. The Miami group 2400 cycles are passing thru the CO at the other end of the chain.

Since all calls are shown on the paper tape, a pay phone is the only safe way to go. And be sure to change place as you go.



An item of interest for readers: For \$1.50 businesses and schools are equipping themselves with "dial-lock", which fits into the "1" position on a dial phone, which eliminates calls except from dial-lock key holders. (For push-button phones, a metal plate covers the buttons-60.) For every piggy action, there is an equal and opposite people reaction. Simply lift the receiver and rapidly push the buttons on the cradle equal to the numbers you would dial. For example, to dial 936-2323 you would push the buttons down (or just one of them) 9 times, 3 times, 6 times, etc., about as fast as a watch ticks, with each push of a button even digit. Keep count, cause its easy to lose count. Or, push the button 10 times, and you can give the operator the number you want, whether its around the corner or across the country. She is well-trained to assist you most ably. The "dial-lock ads" are right, the phone bill is effectively reduced, but it doesn't say whose. L.W., Houston, Texas.

STRENGTH IN NUMBERS!

Sign up all your friends for YIPL. \$2 to YIPL, Room 504, 152 W. 42 St., NY, NY 10036. When our subscription breaks 1000, we'll have a super article!

BUTTON OFFER

We have these cute little Anti-Ball Buttons to raise some bread, and at 50¢ each they probably will. We'd like to see every person in the country wearing these pretty soon. 10 for \$3.

Dear YIPL,

If any YIPL reader has access to info on a pig device called a guardian please publish the description of the resonator tubes. This device is developed in France for use on rioters. Basically it is a tone generator, amplifier, and a high-type exponential horn, fitted with resonator tubes. Supposedly even a hand-held model can cause ear damage and brain hemorrhaging through a sort of "sound laser" effect. Come the revolution sympathetic stereotypes can be turned against the pig. CCS, Yipit. The Credit Card Computer, reported to you about is not yet available to all operators. So in some areas, the old system of simply matching the 4th digit to the letter still works. We've also heard that on the West Coast, the computer is off from 2-4 a.m. for checking, and credit card calls during that time are assumed to be valid. The same thing is true in other areas, but we don't know the times. They may be the same.

BACK ISSUES

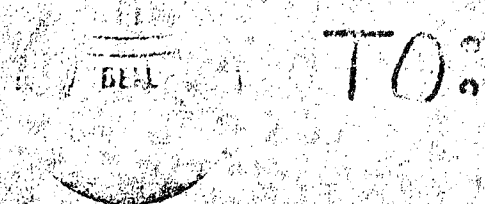
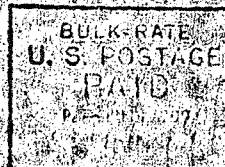
- Credit card calls-How to safely
- Receive long distance calls free
- The Blue Box (this issue)
- Pay phone issue

Back issue are back up to 50¢ each, until we raise some more bread.

FROM YIPL, ROOM 504, 152 W

42 ST., N.Y., N.Y. 10036

(MAIL ONLY)



16



Regulating the Phone Company In Your Home

Article
11020C

The wizardry of America's Phone Phreaks has received considerable attention: in particular, the ability of this esoteric underground to make Bell Telephone's myriad long lines, loops and tandems dance to the calibrated tune of the notorious "Blue Box." But it has generally been assumed that the free long distance phone call was accessible only to those able to build such a Blue Box, and initiated in the mysteries of its use.

The following document which has come into our hands makes clear, however, that our phone company is in danger of being electronically ripped off not only by the technically knowledgeable and skilled, but by virtually anyone and everyone. The document demonstrates how practically anyone who can change the plug o

an electric toaster—using only a screwdriver, a kitchen knife, and four dollars' worth of readily available electric parts—can build in two or three hours a simple device capable of evading charges on long distance telephone calls. This is not the Blue Box, which enables the user to make long distance calls free, but a version of the Mute Box, which enables the user to receive them free of charge to the caller.

BASICALLY A MUTE IS A DEVICE which allows you to receive incoming phone calls from anywhere without charge to the calling customer. By having all your friends call you, you not only eliminate most of your phone bill but at the same time reduce your friends' bill since they won't have to pay to call you anymore. And of course the usual signals can be arranged: you call person-to-person to your own name at your friend's number; he knows to reject the call, hang up, and call you back—free.

Following the directions on this page, anyone with only modest mechanical ability should be able to build a mute in a couple of hours (or less). The mute is a simple device which works on a very simple principle. Normally when you receive an incoming call, your local phone company sends a signal to your phone which causes your bell to ring (this is only to attract your attention). When you pick up the receiver, a small switch inside your phone closes, causing a moderately strong electric current to flow back along the line which stops the phone company's equipment from sending ring signals. Then the equipment sends a signal back toward the person calling you which starts the billing machine in his area.

Hanging up the receiver opens a switch inside your phone which cuts off the current flowing to the phone company. Their equipment then sends a different signal back to the other end indicating that billing should be stopped. The billing equipment then prepares the too familiar monthly statement which eventually is sent to the person who made the call.

There are two ways to avoid billing your friend: either you must send a false end-of-call signal to the other party during the conversation, or you must prevent the local phone company from sending the initial signal back to a relay at the other end which indicates that you answered the phone.

The most common form of mute prevents the initial signal from being sent. It does so by limiting the electric current (that flows through your phone when you are talking) to a level sufficient to allow a conversation, but not enough to activate the relay at the phone company. Thus, the phone company does not start billing the calling party. As far as the phone company equipment at the other end is concerned, your phone is still ringing, unanswered.

The way you build a mute is as follows: First, buy the following parts at a local electronics store such as Radio Shack. The store should have them all in stock (except possibly the capacitor); if not, they will refer you to another for the missing parts. (Do not get paranoid if your name

and address are asked; this is standard information for writing up sales receipts. But, if you're still concerned, have a phoney name and address ready.)

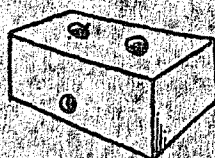
If you are not familiar with electronic components, you can ask for the parts by reading off the following list verbatim to the man at the counter. Do not hand him this article, since then he may become suspicious and report you to the fuzz. If you prefer to present a list of the parts, copy down the list below and hand him that.

Quantity Description

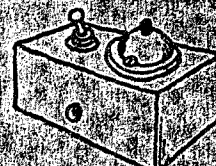
- 1 0.47 microfarad mylar capacitor at 200 volts
- 1 5600 ohm resistor one half watt
- 1 single pole single throw (spst) momentary push-button switch. (The most convenient form of this is a simple doorbell button; it is referred to as such in the following instructions and drawings.)
- 1 single pole single throw (spst) toggle switch
- 1 a small plastic utility box large enough to put all of the parts with plenty of room for wiring the parts together; about 1 1/2" x 4" x 2" will do very well.

About 20 feet of insulated wire.

THE BOX



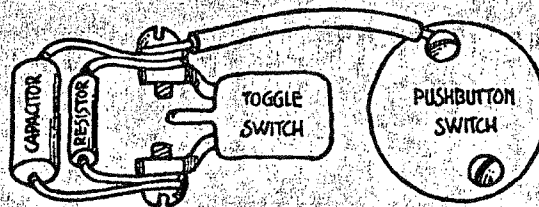
WITH HOLES
DRILLED



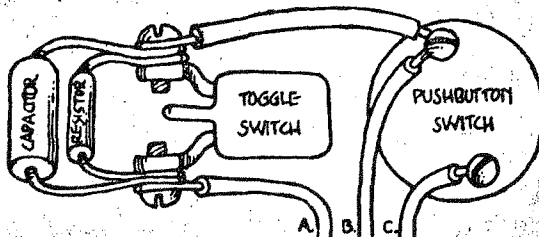
WITH SWITCHES
INSTALLED

Try to remember which part is which since it will help save time during construction. Try to get both switches with screwdown type terminal connections, since this will make soldering unnecessary. (If you have a soldering iron and know how to use it, however, go ahead; you will get more durable connections.) Also, if you get a metal "experimenter box" instead of a plastic box, you will probably need a power drill to make the holes. The holes in the plastic box can be made with an ordinary sharp kitchen knife that tapers to a point. Just use it as if it were a drill; the hole gets bigger as the knife blade goes deeper and you stop when it reaches the desired size. If, as these directions assume, you use screwdown type terminals and a plastic box, the only tools you will need are the knife and a fairly small screwdriver.

1. Make holes in the side of the box (which will be facing upward during use) for mounting the two switches. The size and location of the holes will depend upon the switches used. The toggle switch will usually require a single hole about $\frac{1}{2}$ inch in diameter; the doorbell button will require two small holes for the mounting screws plus a central hole about $\frac{1}{4}$ inch in diameter to pass the wires through.
2. Make a small hole less than $\frac{1}{4}$ inch in diameter (it should be just big enough for 3 wires to go through and fit snugly) in the side of the box (facing away from you during use).

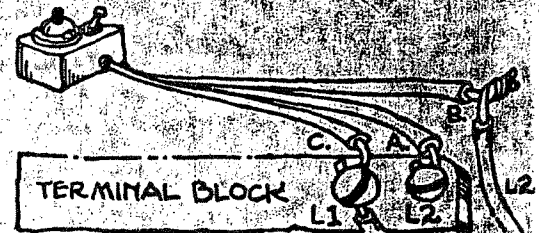


3. Take one wire from the resistor (the small part, usually brown, with the colored bands on it) and attach it to one of the terminals on the toggle switch; attach the other wire to the other terminal of the toggle switch. (Just wrap the wires around the terminal screws, but don't tighten them yet.)
4. Attach one wire from the capacitor (the large, usually yellow, part with the printing on one side) to one of the terminals on the toggle switch; attach the other wire to the other terminal on the toggle switch. (Again, just wrap them around, but don't tighten yet.)
5. Cut a piece of wire 4 inches long and strip $\frac{1}{2}$ inch of the insulation from each end.
6. Attach one end of the wire to either terminal of the toggle switch and tighten; thread the other end of the wire starting inside the box, and out through the central hole where the doorbell button will be mounted and attach it to one terminal of the doorbell button (but don't tighten yet).



7. Cut a 3- to 5-foot piece of wire (depending on how far you may want to keep the mute box from the phone) and attach one end of it to the terminal of the toggle switch which is *not* connected to the doorbell button (now you can tighten this terminal). Label this wire "A".

8. Cut off another 3- to 5-foot piece of wire, thread through the hole where the doorbell button will be attached it to the terminal of the doorbell button which connects to the toggle switch and tighten. Label the wire "B".
9. Cut off a third 3- to 5-foot piece of wire, thread through the hole under the doorbell button, and attach it to the terminal of the doorbell button to which you have so far connected no wires and tighten. Label the wire "C".
10. Attach the doorbell button to the box with its own mounting screws (probably two).
11. Mount the toggle switch into the box.
12. Take the free ends of the three wires and thread them through the hole in the side of the box and pull them out as far as they will go.



13. Take the cover off your phone. If it is a desk phone there will be two screws on the bottom which hold it on (loosening the screws will free the cover; the screws do not come out). If it is a wall phone, there will be a catch on the bottom of the phone which releases the cover. Touchtone wall phones, princess phones, and trimline phones often have catches hidden under a tag which has your phone number on it. If not, look for hidden screws or catches. Some princess phones have screws recessed at each end of the bottom.
14. Run the three wires (A, B and C) into the phone through one of the holes on the back or bottom of the phone where they won't get in your way when using the phone, and pull them through far enough that you can connect them to any of the terminals on the terminal block where most of the wires in the phone connect together.
15. Now do not be intimidated by the spaghetti dish wiring and terminals you see. Only a small, identification portion concerns you. First orient yourself by seeing where the thick cable which connects the phone to the wall enters the phone. This cable contains usually 3 or 4 wires of different colors. Follow the plain green wire from this cable to the terminal on the terminal block which it is connected. Attach your wire C to the same terminal (but do not disconnect the green wire from the terminal block).

For your reference, this terminal usually has a ma

reading "LI" on or near it, and it is usually located at the lower left corner of the terminal block (the LI may be a tiny, almost illegible imprint raised in the plastic of the block). If your phone has several wires coming through the wall cable, including two-colored (striped) wires, then look for the terminal markings rather than the wire color. The same applies for step 16. (Incidentally some phones have a little map of the terminal block pasted inside the phone. This will also help you locate LI.)

One more note: On princess phones the green wire may lead you to a terminal tucked underneath one of the solid grey metal weights placed inside the phone at either end. Don't give up. This weight is not hooked up to anything; with a little wiggling and a screwdriver as a lever, you can pop it out, and replace it when you finish your work.

16. Locate the red wire that leads back to the wall. Follow this red wire to the terminal on the block to which it is connected (usually on the lower left corner of the block and usually labelled "L2").
17. Disconnect this red wire from the terminal block (noting the terminal it came from). Attach wire B to this red wire (not to the terminal), neither B nor the red wire will be reconnected to the terminal block. You should wrap a little tape or piece of band-aid around this connection.
18. Attach wire A to the terminal from which you just removed the red wire in the previous step.
19. Put the cover back on the phone and pull the three wires out of the phone as far as they will go without ripping them out. You can wrap the three wires together with tape to keep them neat.

YOU ARE NOW READY TO TEST your mute. Use the following test procedure (if any step fails, start at step 1 after making repairs).

1. Pick up your phone. If you get a dial tone throw the toggle switch to the other position. If you still have a dial tone, then you have a short circuit in your mute, and you will need to repair it. Label the position of the toggle switch which did not produce a dial tone "mute" for "muting position." Leave it in this position for step 2.
2. Push the doorbell button down: you should hear a click, and the background noise on the line should disappear. Hold the button down for several seconds and then let go: you should hear a short burst of dial tone. If you do not hear a click when you push the button, and a burst of dial tone when you release the button after holding it down for several seconds, you have a faulty circuit.
3. Throw the toggle switch into the non-mute position and listen. You should get a dial tone within a few seconds. If you do not get a dial tone, you will have to repair the

mute since, without a dial tone, you will not be able to make outgoing calls on the phone.

4. To run a full-scale test on the mute, have a friend call you long distance at a pre-arranged time. When the phone rings, set the toggle switch to the muting position. Then pick up the phone: you should hear a loud buzz on the line every 6 seconds and you should be unable to converse with your friend. (If the line is clear and you can converse with your friend, then the mute is not working and he is being charged for the call.)
5. Push the doorbell down for a very short period of time NEVER to exceed ONE SECOND. The line should now be clear, and you can talk with your friend (the buzz will keep coming on at 6 second intervals); but, if the line doesn't clear and you can't hear him or he can't hear you, then the mute isn't working.
6. Tell your friend to hang up, but do not hang up yourself: if you get a dial tone within 30 seconds, the mute is not working and will need to be repaired.
7. Find out from your friend whether he got billed for the call (to be extra safe, wait two months.) If he didn't, your mute is working. Congratulations!!!

CAUTION: If you leave the toggle switch in the muting position when the box is not in use, it will mute the ringing of incoming calls. Be certain the toggle switch is in the muting position *before* answering a call you wish to mute. Do not push the doorbell for more than ONE SECOND. And do not tell curious friends what the device is. Also tell your friends who wish to make a muted call to you, only to direct dial, never to call you through an operator or from a pay phone when you will be using your mute.

DETECTION: The mute works by simulating a situation where phone A tries to call Phone B, and phone B doesn't answer. Thus, while you are talking, it is as if the caller were hanging on and letting the phone ring and ring. To detect the use of a mute, the phone company has to try to "zero in" on what appear to be attempted calls where the caller persists in the attempt for an extraordinary length of time even though the call is not completed. (Anyone who has tried, for example, to get the information desk at a railroad terminal knows that this is sometimes a genuine occurrence.)

Because of the sheer volume of telephone calls and various technical difficulties such "zeroing in" has not proved to be very easy. There are a number of tests you can make to determine the kind of circuitry in your phone exchange and appropriate precautions you can take. But these are primarily for those who are going to engage in muted calls of considerable length. The simplest precaution, therefore, is to keep each muted call under 5 minutes, and, if you want to talk some more, have your friend hang up and call again. It would be irresponsible to pretend that all risk can be eliminated, but the safety record of such modest, under-5-minute muting has been very good.

—R. OKLAHOMA

UNITED STATES GOVERNMENT

Memorandum

TO : Mr. Soyars

DATE: 11/28/72

FROM : M. F. Row

SUBJECT: *Individual*
ALLEGED INTERCEPTIONS OF THE COMMUNICATIONS
OF GOVERNMENT OFFICIALS

Felt _____
Baker _____
Bishop _____
Callahan _____
Cleveland _____
Conrad _____
Dalbey _____
Gebhardt _____
Jenkins _____
Marshall _____
Miller, E.S. _____
Purvis _____
Soyars _____
Walters _____
Tele. Room _____

Re letter to the Acting Director from the Assistant Attorney General, Criminal Division, dated November 8, 1972, *sent* captioned as above.

The referenced letter contains information alleging that certain individuals using "blue boxes" could get into the National Crime Information Center (NCIC) system. The ability for anyone to accomplish this feat hinges on two different areas. First, they would have to seize a communications line coming into the NCIC. Second, they would have to have knowledge of the formats and procedures of the NCIC system.

It is felt that the Laboratory Division is best able to discuss the feasibility of anyone seizing a dedicated communications line in the NCIC system. The following discussion will be limited strictly to the consequences assuming it was possible to seize an NCIC line at a remote location.

CDN:jlh

(5)

1 - Mr. Conrad

1 - Mr. Soyars

1 - [redacted]

JAN 11 1973

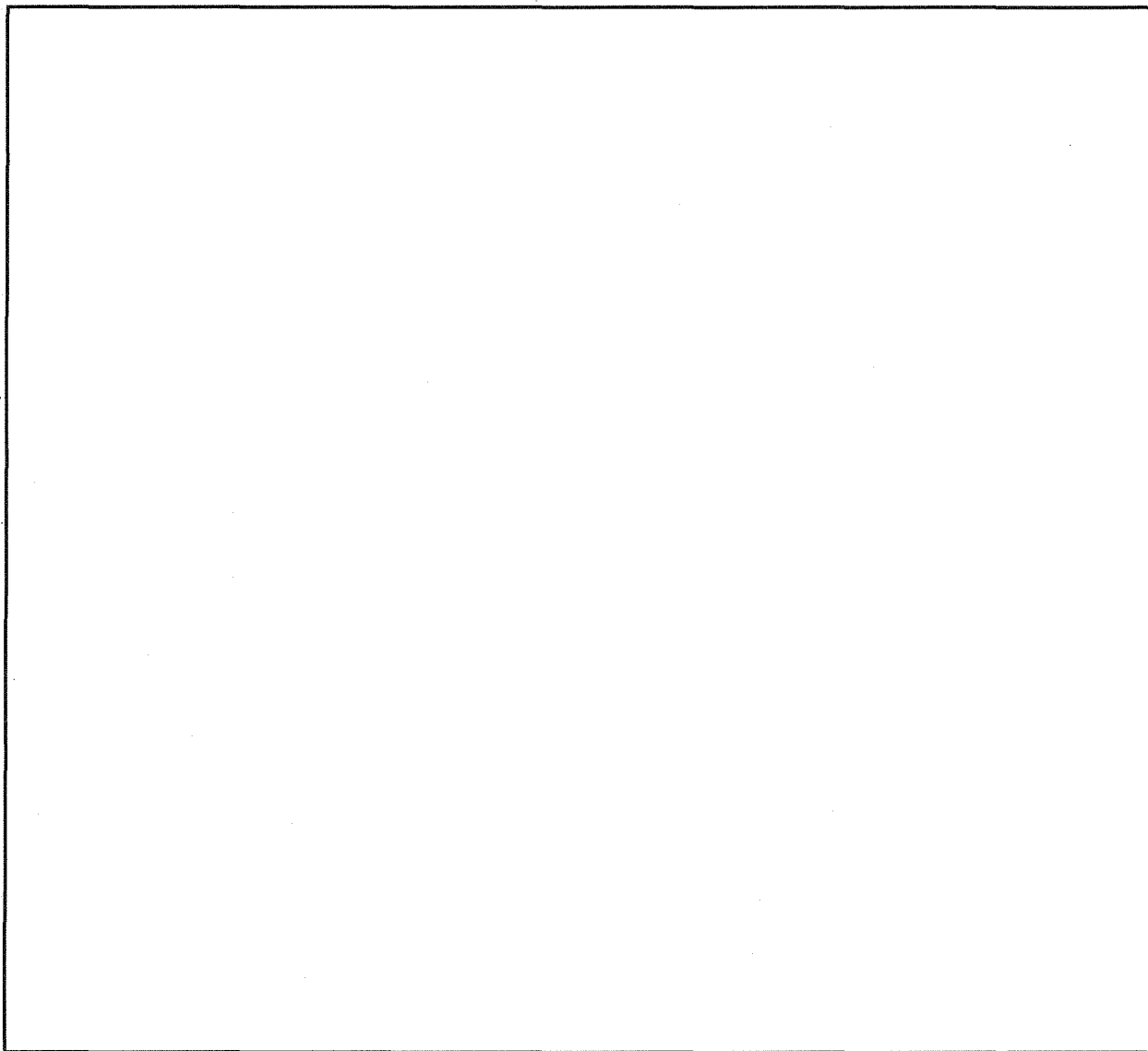
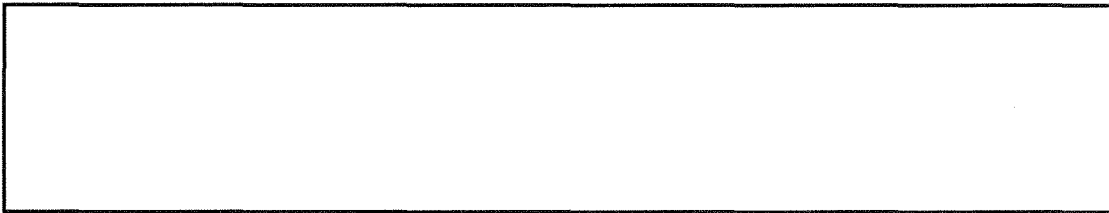
JAN 4 1973

UNRECORDED COPY

Memo Row to Soyars

RE: ALLEGED INTERCEPTIONS OF THE COMMUNICATIONS
OF GOVERNMENT OFFICIALS

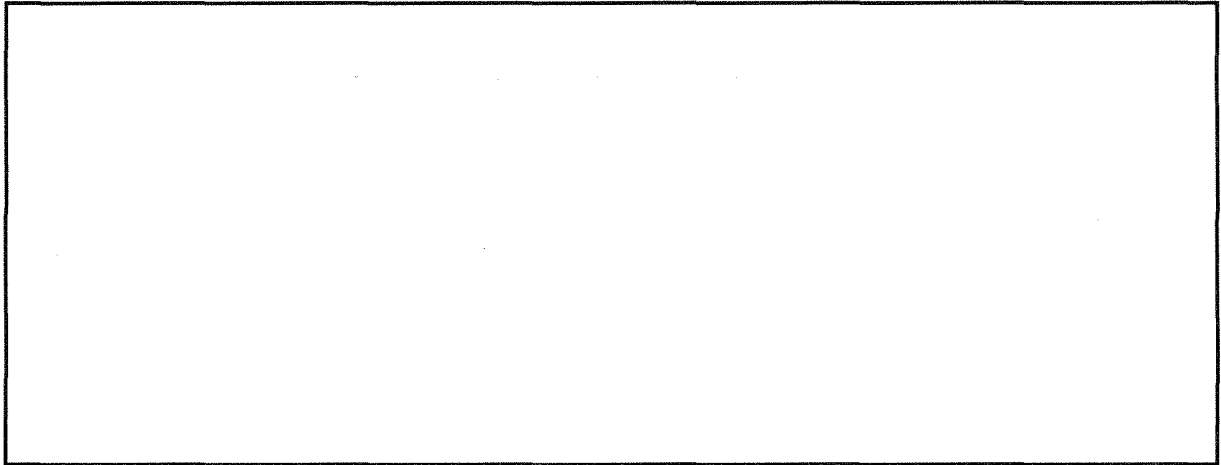
b2
b7E



Memo Row to Soyars

RE: ALLEGED INTERCEPTIONS OF THE COMMUNICATIONS
OF GOVERNMENT OFFICIALS

b2
b7E



It is our opinion that it is impossible for anyone without inside information to tap into and obtain information from NCIC without detection. It is of course possible for anyone with a knowledge of NCIC formats and procedures to get into and obtain information from NCIC if it is possible for them to gain access to a dedicated NCIC line using a "blue box." This latter question is being left for the Laboratory Division to address.

RECOMMENDATION:

That the views of the Laboratory Division be solicited as to the ability of an individual using a blue box to seize a dedicated line to NCIC.

WBS
DMM
cm

CB

Assistant Attorney General
Criminal Division

December 26, 1972

For the Acting Director, FBI
W. Mark Felt

REC-96 Acting Associate Director 4
ALLEGED INTERCEPTIONS OF THE
COMMUNICATIONS OF GOVERNMENT
OFFICIALS
INTERCEPTION OF COMMUNICATIONS

1 - Mr. Gebhardt

1 - [Redacted]

1 - Mr. Conrad

1 - Mr. Soyars

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Reference is made to your memorandum dated November 8, 1972 (HEP:CWB:JLW:km), and the memorandum of this Bureau's Houston Office dated November 22, 1972, which was forwarded to the Criminal Division of the Department.

Your memorandum concerns allegations by [Redacted] of Houston, Texas, that "blue boxes" (electronic tone generators used to gain access to and dial within the telephone toll network) are being used to intercept, without detection, telephone calls of unnamed high Government officials and that 21 unnamed U. S. Senators have purchased these devices for the purpose of bypassing possible wiretaps. Additionally, it was alleged that our National Crime Information Center (NCIC) computer system is vulnerable to access through utilization of a "blue box."

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62-110866-
62-12114-

Regarding the allegation that "blue boxes" were being used to intercept the telephone calls of high Government officials, it is the understanding of the FBI that the Bell System and most independent telephone companies do not now provide facilities which will permit dialing into a call in progress. As such, the "blue box" could not be used for direct interception of a call in progress; however, if any telephone company does incorporate such facilities, direct interception would be technically feasible. There is always a possibility that the user of a "blue box" could, by pretending to be a telephone company service employee, "con" a telephone company operator into manually connecting him into a call which might be in progress. In this event, the "blue box" could be used to make the interception, with assistance of a telephone operator.

ST. M. 3-10-73
MOOR

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MAILED 3
DEC 26 1972
FBI

- Felt
- Baker
- Callahan
- Cleveland
- Conrad
- Dalbey
- Gebhardt
- Jenkins
- Marshall
- Miller, E.S.
- Purvis
- Soyars
- Walters
- Tele. Room

DEC 5 9 08 PM '72
JJC:efg
DEC 5 9 08 PM '72

DEC 11 1972
12-28
8:52A

SEE NOTE PAGE TWO...

DEC 26 11 21 AM '72
RECEIVED WAF

MAIL ROOM ☒ TELETYPE UNIT ☐

JAN 16 1973

Assistant Attorney General
Criminal Division

Concerning the allegation of the vulnerability of our NCIC computer system, it is the opinion of our computer experts that it is impossible for anyone without inside information to tap into and obtain information from NCIC without detection. It is impossible for any outsider ever to seize control of the computer, although it is possible for an outsider with sufficient technical capability and equipment and who can locate an accessible telephone terminal through which an NCIC dedicated line passes, to monitor traffic on that line.

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In view of the vagueness of the allegations and the apparent lack of sincerity on the part of [redacted] as shown in our November 22, 1972, memorandum, no further investigation will be conducted in absence of a specific request from the Department.

NOTE: This matter was received from AAG Henry E. Petersen for whatever action FBI deems appropriate. The views of the Laboratory and Computer Systems Divisions were obtained (attached) and were, in part, included in this reply. Houston Office characterized [redacted] as a "professional" informant who was attempting to promote himself further with the Department of Justice. He has continually tried to solicit funds from law enforcement agencies and the telephone company. In view of this, no additional investigation is being conducted.

UNITED STATES GOVERNMENT

Memorandum

TO : Mr. Conrad *Wes*

DATE: December 7, 1972

FROM :

Individual
Wes

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SUBJECT:

ALLEGED INTERCEPTIONS OF THE COMMUNICATIONS
OF GOVERNMENT OFFICIALS

Felt _____
Baker _____
Bishop _____
Callahan _____
Cleveland _____
Conrad _____
Daly _____
Gebhardt _____
Jenkins _____
Marshall _____
Miller, E.S. _____
Purvis _____
Soyars _____
Walters _____
Tele. Room _____

Re letter to the Acting Director from the Assistant Attorney General, Criminal Division, dated November 8, 1972, captioned as above.

The referenced letter contains information alleging that certain individuals using "blue boxes" could gain access to the National Crime Information Center (NCIC) System and were using "blue boxes" to intercept the telephone calls of "high Government officials."

"Blue boxes" are electronic tone generators which generate the signaling tones used to access and dial within the telephone toll network. These tones are not the same as are on a subscriber home-type touch-tone telephone set.

The Laboratory has been familiar with "blue boxes" for many years and has examined a number of these devices submitted by the field. The Laboratory also continually maintains liaison with Bell Telephone Laboratories at Holmdel, New Jersey, regarding telephone switching systems including the capabilities of such devices as the "blue box."

By memorandum from M. F. Row to Mr. Soyars, 11/28/72, under this same caption, it is stated that [redacted]

[redacted] Based on this statement, "blue boxes" would not be capable of providing access to NCIC.

- 1 - Mr. Gebhardt (Attn: [redacted])
- 1 - Mr. Soyars (Attn: Mr. Row)
- 1 - Mr. Conrad

1 - [redacted]
1 - [redacted]

WEH:mrg
(6) *mrg*

REC-96

139-4173-4

12 JAN 4 1973

*Let to AAC
JJC:cye
12/26/72*

12/26/72

JAN 11 1973

CONTINUED - OVER

RECORDED COPY FILED 139-4173-4

Memorandum to Mr. Conrad

RE: ALLEGED INTERCEPTIONS OF THE COMMUNICATIONS
OF GOVERNMENT OFFICIALS

The question of feasibility of anyone seizing, tapping, or monitoring a dedicated communications line in the NCIC System is raised by this memorandum. For the Bureau's information, the above comment that the "blue box" could not provide access to NCIC does not mean that the dedicated NCIC lines cannot be tapped in some other, conventional manner. Dedicated lines are no less, and in most cases are more, susceptible to being tapped than regular telephone facilities. Anyone with sufficient technical capability and equipment who can locate an accessible telephone terminal through which the dedicated line passes could monitor traffic on that line.

Regarding the allegation that "blue boxes" were being used to intercept the telephone calls of high Government officials, it is the Laboratory's understanding that the Bell System and most independent telephone companies do not now provide facilities which will permit dialing into a call in progress. Where the companies do not provide such facilities, the "blue box" could not be used for direct interception of a call in progress; however, if a given company does incorporate such facilities, direct interception would be feasible. In addition, for the Bureau's information, it is pointed out that there is always a possibility that the use of a "blue box" could, by pretending to be a telephone company service employee, "con" an appropriate telephone operator into manually connecting him into a desired call which might be in progress. In this event, the "blue box" would be used to call the desired operator and the "con job" would have to be successful to make the interception.

ACTION:

For information.

CAN

JWC
RSC
BSC
CB
WAF

FBI

Date: 11/22/72

Transmit the following in _____

(Type in plaintext or code)

Via AIRTEL

AIRMAIL

(Priority)

b2
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b7D

TO: ACTING DIRECTOR, FBI
FROM: SAC, HOUSTON (139-168) (C)

SUBJECT: UNKNOWN SUBJECT;
ALLEGED INTERCEPTIONS OF COMMUNICATIONS
OF GOVERNMENT OFFICIALS
INTERCEPTION OF COMMUNICATIONS
(OO:HO)

John A. Wood
Mr. Soyars
Mr. Cleveland
(Informant Desk)

Enclosed for Bureau are five copies of an LHM and two groups of xerox pages pertaining to [redacted]

The xeroxed enclosures were previously obtained from [redacted] during contact by SA [redacted] who is a Bureau sound-trained agent to whom a "blue box" case involving [redacted] was assigned, (Bureau files [redacted] and [redacted])

The other individual mentioned in the Departmental Memorandum [redacted] for [redacted] a business associate of [redacted]

No further interview of [redacted] will be conducted at this time for the following reasons:

(1) he is considered by SA [redacted] to be a "professional" informant who is attempting to promote himself further with the Department of Justice.

(2) During previous contacts with [redacted] he has bragged of the fact that he obtained approximately \$13,00 from the Department of Justice "in the past year" for help he had furnished to the Southern District of New York.

2-Bureau (Enc. 7)
3-Houston (2-139-168)
(1 [redacted] Enc. 1)

RWS:ejc (5)

139-41735
139-168-1144
11/30/72
gjc/07
2-Rom Crim Div by 06D
1-Tukler
JUC L.S. MOHR
572x (ITSP) info

7 NOV 29 1972

Approved

70 JAN 15 1973

Special Agent in Charge

Sent

M

Per

(3) He has contacted the ASAC, a supervisor, and approximately four or five individual agents in the Houston Division in attempts to furnish various types of information

(4) he told SA [] that he had telephonically contacted "FNU ROOSEVELT" a departmental attorney in the Southern District of New York regarding the [] Blue Box matter and ROOSEVELT told him he could not understand the Federal Government's jurisdiction in this matter.

(5) [] Vice Squad, Houston Police Department also told SA [] that [] had discussed the [] Blue Box matter with him

(6) In addition [] requested SA [] furnish him with the identity of special agents and AUSAs in Dallas, Texas, who were investigating a related blue box matter in that city []

[] ET AL,
Bufile [] In this regard [] told SA [] "I think I know who your source is up there". He also requested the identity of the AUSA at Houston to whom this Blue Box case was assigned, inferring that he desired to discuss the matter with him personally.

It appears that [redacted] probably met JAMES WHITTEN through [redacted] when WHITTEN was in Houston to present the [redacted] IOC matter to the Federal Grand Jury, (Bufile [redacted])

[redacted] although he did make available the enclosed xerox copies of information from public magazines and other information which he obtained [redacted] [redacted] has furnished no information in this matter which was not previously obtained from other sources. During his initial contact with the Houston Office (ASAC, Supervisor [redacted] and SA [redacted])

[redacted] claimed that he wanted to "clarify the ground rules" with reference to his conduct and contacts with [redacted] which he was "undertaking on behalf of the Bureau". The ASAC tactfully and forcibly advised [redacted] that the FBI could in no way grant him license to violate the law or condone any activities by him which involved violations of the law, either Federal or local. He was also advised by the ASAC that this office appreciated his assistance in connection with our investigation of [redacted] [redacted] and that he should continue to furnish information concerning this matter immediately upon receipt, taking every precaution to avoid becoming involved in illegal activity. He also inquired of the ASAC whether the Bureau could reimburse expenses encountered by him and specifically the purchase of a Blue Box for the sum of \$1500. He was instructed that under no condition should he purchase a blue box in anticipation that the Houston Office would reimburse him for such purchase. He was advised that the Bureau would reimburse expenses within reason which he incurred while cooperating with this office in items such as transportation, meals, etc. provided that he cleared these with this office before doing so. [redacted] stated he understood perfectly and would continue to assist this office where ever possible.

In subsequent contacts by SA [redacted] the case agent in this matter, it was determined that [redacted] had little, if any, additional information in connection with this matter and he was emphatically advised (after he had brought the subject up several times) that the FBI had no funds for, and had no intention of purchasing any blue boxes. He was told that if he came into possession of any such device that it would have to be through his own devices and that the blue box would be confiscated at the termination of the FBI investigation into this matter. He stated that he understood this and requested to be placed in contact with representatives of the local telephone company.

HO 139-168

SA [] introduced [] to []

[] was advised that any financial arrangements he made with the telephone company would be between himself and that company and the FBI had no interest in such arrangements.

[] subsequently advised that [] attempted to convince the telephone company that he could improve the existing blue box which [] had in his possession and would be able to convince [] of his electronic knowledge.

[] is known to have traveled to several different cities extensively in connection with this blue box matter, however none of these trips were discussed with him by the FBI and no arrangements were made to pay him for expenses incurred.

[] He subsequently attempted to contact the SAC of the Houston Division and being unsuccessful, contacted Supervisor [] supra, demanding that the FBI pay him for expenses etc. incurred in connection with his cooperations with the FBI and setting a figure at \$9000. This demand was of course refused.

In connection with [] claims that many Congressmen and other individuals throughout the U.S. are in possession of these devices, it should be noted that [] also told the telephone company that they had heard [] supra, stated that [] supra, made a statement that many Congressmen in Washington had purchased blue boxes inasmuch as this freed their telephone lines of any wire tapping attempts. In an interview with [] a Houston, Texas businessman [] also advised that when he purchased a blue box from [] made similar claims to him. [] believes that these claims were simply to alleviate any suspicion of his part that the device was illegal as far as Federal law was concerned and to convince [] that this device had merit.

Inasmuch as SA [] is a Bureau sound-trained agent, particular interest was paid to [] claims to SA [] that the blue box could be used to penetrate "verification jacks". He was especially queried concerning these claims and methods whereby this could be accomplished. [] not being aware of the technical knowledge of SA [] attempted to "snow" him and finally stated that his belief came from the fact that such claims were alluded to as noted on page one of the xeroxed enclosures. He was unable to describe or demonstrate an ability to penetrate verifications jacks.

Regarding [] claims that the blue box could be used to penetrate NCIC computers, it should be noted that SA [] is also the NCIC coordinator of Houston, has attended several NCIC training schools and is somewhat knowledgeable in the method whereby NCIC terminals access the NCIC computer and have their telephone lines edited. [] was queried considerably concerning these claims and was never able to furnish any concrete information or description or circuitry whereby such penetrations could be accomplished.



UNITED STATES DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION

In Reply, Please Refer to
File No. 139-168

Houston, Texas

November 22, 1972

Alleged Interceptions of The
Communications of Government
Officials

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[redacted] Houston, Texas, has cooperated with the Houston Division of the Federal Bureau of Investigation in connection with investigation being conducted at Houston concerning [redacted] of Minneapolis, Minnesota. A joint investigation has been conducted by Federal Bureau of Investigation officers at Minneapolis, Cleveland, Ohio, Memphis, Tennessee, Dallas, Texas, and Houston, Texas in cooperation with representatives of local telephone companies since approximately May, 1972.

In August, 1972, [redacted] approached the Federal Bureau of Investigation with an offer of cooperation in the [redacted] investigation in return for attempts by the Federal Bureau of Investigation to stop or slow down a State investigation concerning one [redacted] who was under the felony indictment for theft and illegal use of telephone company equipment. [redacted] was emphatically advised that the Federal Bureau of Investigation could be no part of any "deals", could in no way finance or condone his activities in any illegal venture and that any such activities on his part would be considered a violation of the law unless at the specific instruction of the Federal Bureau of Investigation. No such instructions were ever furnished to [redacted] did furnish some information in connection with the investigation regarding [redacted] supra, which corroborated information obtained through independent Federal Bureau of Investigation investigation.

[redacted] has previously been interviewed in connection with his claims that "blue boxes" could be used to intercept telephone calls of anyone especially Government officials. He was also specifically queried concerning claims that blue boxes could be used to penetrate NCIC computers at Washington, D.C. He was unable to furnish any specifics, techniques, circuitry, or any other information which would tend to corroborate these claims.

139-4173-5139-0-1044
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ENCLOSURE

Alleged Interceptions of The
Communications of Government
Officials

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No Loc Information which [redacted] did make available has been furnished to the Federal Bureau of Investigation Laboratory for their information and evaluation. The "blue box" is a name given to an electronic device which is designed and capable of emitting audio tones which will allow the user to simulate telephone company operators "instructions" through telephone company equipment and thereby place calls throughout the world. In this connection, all such calls originate by placing a call into a toll free inward watts number somewhere in the United States or overseas and, after seizing a telephone company trunk, placing additional telephone calls thereby circumventing normal telephone company automatic billing procedures.

National Circuits - Carrier Systems over Very Short Distances: Assuming that circuits in an international network, making use of frequency-division-multiplex carrier systems over very short distances, can be limited in number to 4, the mean telephonic power should not exceed 2000 pWp0 per circuit during any hour, including crosstalk.

The CCITT does not yet offer Recommendations for pulse-code-modulation systems. (G.123)

Design Objectives for Noise Produced by Modulating Equipments

The mean telephonic power, which corresponds to the noise produced by all modulating equipment mentioned in the definition of the hypothetical reference circuit in question, should not exceed 2500 pWp0. This value includes noise due to various causes, such as thermal noise, intermodulation, crosstalk, power supplies, etc. Its allocation between the various equipments can be left to the discretion of designers, but the following values are given as a guide to the target design values.

	pWp0
One pair of channel modulators	200-400
One pair of group modulators	160-100
One pair of supergroup modulators	80-100
One pair of mastergroup modulators	80-120

(G.222, Section d)

CCITT AND TELEGRAPHY

The CCITT Blue Book contains the Recommendations adopted by the Third Plenary Assembly in Geneva, in 1964. The Recommendations on Telegraph Technique are included in Volume VII, and those on Data Transmission are included in Volume VIII. The Recommendations on Telegraph Operations and Tariffs are contained in Volume II of the Red Book and in Documents AP III-64, -67, and -74. The latter (AP III-74) has been importantly revised by CCITT Circular No. 15 dated 12 November 1964 entitled "List of Destination Indicators."

Numbering

There is a worldwide system of Destination Indicators for the telegraph-message retransmission network. These indicators consist of two letters signifying the country and its telegraph network (if more than one) followed by two letters signifying the town on that network. Examples: Vienna AUWI, Panama City (Tropical Radio) PAPA, Balboa (ITTCAIR) PZBA, Stockholm SWSM, San Francisco (ITT Worldcom) UISF.

The CCITT has approved a worldwide numbering system for telex services. The telex designation code consists of 2 or 3 numerical digits signifying the country or network within the country; the destination code is followed by the telex number's national number, also consisting of numerical digits.

The telex system provides also for designation codes, for identifying the country and network of

TABLE 3—CCITT SIGNALING SYSTEMS.

No.	System
1	500/20-hertz system used in the international manual service (ringdown).
2	600/750-hertz 2-frequency system. Never used in international service.
<i>International Automatic and Semi-automatic Systems</i>	
3	For bidirectional operation of circuits. Uses 1 in-band frequency (2250 hertz) for the transmission of both line and interregister signals; used for terminal traffic; in general not to be used for new installations.
4	For unidirectional operation of circuits (circuits seized from one end only). Uses 2 in-band frequencies (2040 and 2400 hertz) for the end-to-end transmission of both line and register signals; used for international intra-continental traffic; suitable for terminal and transit traffic; in the latter case 2 or 3 circuits equipped with System No. 4 may be switched in tandem. Suitable for submarine- or land-cable circuits and microwave radio circuits; not applicable to TASI-equipped systems. Capable of interworking with System No. 6.
5	For both-way operation of circuits. Uses 2 in-band signaling frequencies (2400 and 2600 hertz) for the link-by-link transmission of line signals, and 6 in-band frequencies (700, 900, 1100, 1300, 1500, and 1700 hertz) in a 2-out-of-6 code (numerical information transmitted en bloc) for the link-by-link transmission of register signals; used for intercontinental traffic. Suitable for submarine- or land-cable circuits and microwave links, whether or not TASI is used; suitable for terminal or transit traffic—in the latter case, 2 or more circuits equipped with System No. 5 may be switched in tandem but are subject to possible undesirable delays if all are TASI-equipped. Capable of interworking with System No. 4.
6	A proposed system to be free from some limitations of Systems No. 3, 4, and 5; expected to use voice channel for interregister signaling, plus a separate channel for line signaling and "management" signaling (changing of routing, etcetera); not expected to be in use before 1970.

REFERENCE DATA FOR POLYENGINEERS

* Combination No. 15 of address code.

[illegible]

IN-LINE WATS NUMBERS

<u>Toll Free Number</u>	<u>Area Code</u>	<u>City</u>	<u>Company</u>
1-800-238-5000	901	Memphis	American Express
1-800-654-3131	405	Oklahoma City	Hertz
1-800- ^{458 555} 621-6547 8670	312	Chicago	Holiday Inn
1-800- ³¹⁹ 325-3535	314	St. Louis	Sheraton
1-800-637-9500	217	Springfield, Ill.	Flagship Inn
1-800- ¹ 221-2662	212	New York City	Sonesta Reser.
1-800-648-6864	714	San Diego	Stardust/Las Vegas
1-800-631-1972	201	Newark	World of Celanese
1-800-243-6000	203	Connecticut	
1-800-428-1826	317	Indianapolis	Curtis Publishing
1-800-553-9550	515	Des Moines	
1-800-228-9550	402	Omaha	Budget Rent-a-Car
1-800- ¹⁵⁰⁰ 521-0780	313	Detroit	
1-800-328-4567	612	Minneapolis	National Rent-a-Car
1-800-824-0986	415	SF/Sacramento	
1-800- ^{6171 code blank} 421-0680	213	Los Angeles	Cinerama
✓ 1-800-527-6168	214	Dallas	Las Brisas Reser.
1-800-525-9040	303	Denver	Diners Club
1-800-327-4960	904	Jacksonville	
1-800-228-9290	402	Omaha	Marriott Reser.
1-800-441-9485	215	PHILADELPHIA	
1-800- ⁴¹⁵ 521-0780	415	San Francisco	
1-800-327-9845	305	MIAMI	EXEL. SEC. INTL.
1-800-342-3572	713		LOEWS HOTEL RES.

IN-LINE WATS NUMBERS TO KEY CITIES

Jacksonville, Fla.

904-327-44 digits

Pittsburgh, Penn.

412-245-1234

White Plains, NY

914-431-1234

Oakland, Calif.

415-227-1234

Overseas

Gateway City

Gateway Code

Cable or Satellite

Country Code

City Code

Number

+415 186-
OAKLAND

JACKSONVILLE

PITTSBURGH

DENVER

Dial 800 or Source

GATEWAY
CITY
WPAINS

STARTS TO RING

G. Code
U.K.

+ 914 182

SAT. (listen for tone)

+ 044 144 1246 8094

Cable

C. Code
England

City Code
LONDON

Number

200

201	631	(NORTH NEW JERSEY)		
02	424	(D.C.)	12	221, 223 (NEW YORK CITY)
03	243	(CONSTRUCTION)	13	235, 421, 423 (LOS ANGELES)
04		(MONTGOMERY)	14	527 (DALLAS)
05	633	(Alabama)	15	441, 523 (PHILADELPHIA)
06	426, 541	(Seattle)	16	321 (NEW ORLEANS)
07	341	(MAINE)	17	447, 637 (SPRINGFIELD, ILL.)
08		(IDAHO)	18	(DULUTH)
09	314	(CRESCENT)	19	398 (INDIANAPOLIS)

400

401		(RHODE ISLAND)		
02	228, 445, 831, 843	(OMAHA)	12	245, 458 (ST. LOUIS)
03		(ALBANY)	13	556, 628 (NEW YORK CITY)
04	241, 891	(ATLANTA)	14	558 (ATLANTA)
05	654	(OKLAHOMA CITY)	15	227 (OKLAHOMA CITY)
06	548	(MONTGOMERY)	16	227 (MONTGOMERY)
07			17	227 (MONTGOMERY)
08	538	(SAN JOSE)	18	227 (SAN JOSE)
09			19	472 (SAN JOSE)

300

301	638	(MARIETTA)		
02		(DETROIT)	12	323, 621 (CHICAGO)
03	443, 525	(Colorado)	13	248, 521 (DETROIT)
04	624	(W. VIRGINIA)	14	325, 851 (ST. LOUIS)
05		(E. FLORIDA)	15	(CENTRAL NEW YORK)
06		(SARASOTA)	16	835 (MICHIGAN)
07		(WYOMING)	17	328, 428, 457 (INDIANAPOLIS)
08		(W. NEBRASKA)	18	(SARASOTA)
09		(PERRIN)	19	(DUBUQUE)

500

501	643	(ARKANSAS)		
02	626	(W. KENTUCKY)	12	531 (SAN ANTONIO)
03	547	(OREGON)	13	354, 558, 752 (SAN ANTONIO)
04	535	(NEW HAMPSHIRE)	14	531 (SAN ANTONIO)
05	545	(NEW HAMPSHIRE)	15	247, 555 (SAN ANTONIO)
06		(NEW HAMPSHIRE)	16	645 (SAN ANTONIO)
07		(ROCHESTER, N.Y.)	17	(SAN ANTONIO)
08			18	448, 833, 847 (SAN ANTONIO)
09		(SPRINGFIELD)	19	(SAN ANTONIO)

600

601 647,551 (MISSISSIPPI)
 02 528 (ARIZONA) 12 328,346,533 (MINNESOTA)
 03 258 (NEW HAMPSHIRE) 13 (OTTAWA)
 04 (B.C.) 14 282 (S.E. OHIO)
 05 (S. DAKOTA) 15 251 (E. TENNESSEE)
 06 (ILLINOIS) 16 253,338 (W. MICHIGAN)
 07 (ALABAMA) 17 225 (BOSTON)
 08 356, 326 (HAWAII) 18 (S. ILLINOIS)
 09 257 (S. NEW JERSEY) 19
 10 TWX

800

301 453,655 (UTAH)
 02 451 (VERMONT) 12 (S. INDIANA)
 03 845 (S. CAROLINA) 13 (W. FLORIDA)
 04 14 (N.W. PENNSYLVANIA)
 05 (BAKERSFIELD) 5 45,457 (ROLA, MO.)
 06 (AMARILLO) 16 75,641,821 (MASSACHUSETTS)
 07 (E. MANITOBA) 17 5, 133,858 (T.F. WORTH)
 08 (HAWAII) 18 (W. ILLINOIS)
 09 19
 10 TWX

700

701 (NORTH DAKOTA)
 02 (NEVADA) 12 (W. IOWA)
 03 336 (VIRGINIA) 13 231 (HOUSTON)
 04 534, 438 (MARLONE) 14 648, 854 (SAN DIEGO)
 05 (W. ONTARIO) 15 (EAU CLAIRE)
 06 16 828 (BUFFALO)
 07 358 (SALT LAKE) 17 233 (N.E. TEXAS/LORAIN)
 08 18
 09 (S. NEW JERSEY) 19
 10 TWX

900

901 238 (MEMPHIS) 11 LOCAL F. COOPER /
 02 (NOVA SCOTIA) 12 (SAVANNAH)
 03 13 (HOPE, GA.)
 04 237,327 (N. FLORIDA) 14 431 (DOUGLASS, MISSISSIPPI)
 05 15 (W. TEXAS)
 06 (UPPER PENINSULA MICHIGAN) 16 824 (SACRAMENTO)
 07 17
 08 18 331 (TULSA)
 09 19 537 (N. CAROLINA)
 10 TWX

10-11-55

مجلسه اول

100-30-674-1751

06-62-24

Chlorine 87.61%

1. Chlorophyll content of leaves
 2. of leaves of leaves
 3. of leaves of leaves

85-20 11/1/55

... of oil (L...

DATE 03-24-1964

6/10/55

Cuba - Of the 100,000 Cubans

Exp. 1000 1000 1000 (1000)

Ed. 01 (10/15)

1941-1942
 1943-1944

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of 11 (Lined)

10/22/21 09:11
 Time: 10:00 AM

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Order of the (C. L. L.)
The (C. L. L.)

Tained 8000 ("")

Section 87(2)(b) ()
Section 87(2)(b) ()

Class: 2nd ()
 Date: 10/10/2020

1. 04 12 1991 (10000)
 2. 04 12 1991 (10000)

" 04 12 2711 (1000)
 7-11 04 12 2711 (1000)

James 01 12 1942 (1942)
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Kanya (1915) (1915)
 Kanya (1915) (1915)

Don. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 8

10. The following information is for your information only:

5

100

Passer + 13 + 11 = 24

1969-70 411-2
 1969-70 411-2

1944-45
 1945-46

7-11-71 4-115611

100-443887-100

415 171 015. 1983.

1950

NO. 00-6940

100

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

8. : Hong Kong 75+5
 6. : Malaysia 60 CII
 : Russia 45
 : Indonesia 40
 3.4 : Poland 45 CII
 3.4 : Czechoslovakia 45 CII
 3.4 : Germany 45 CII (London) Roofing
 3.4 : Spain 34 CII
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2.6 : S. Africa 27 CII
 2.6 : Netherlands 27 CII + 13

I No. America xpi Mexico

II Africa

U.A.R. 20
 Guinea 23
 S. Africa 27

III Europe

France 23
 U.K. 44
 Holland 31
 Belgium 24
 Italy 39
 Greece 30
 Switzerland 41
 Denmark 48
 Sweden 46
 Norway 47
 Germany 47
 Luxembourg 252
 Poland 43
 Czechoslovakia 42
 Spain 34

IV S. America - Latin American Region

Argentina 54
 Venezuela 58

V So. Pacific

Australia 61+2
 New Zealand 64
 New York 66
 Malaysia 60

VI U.S.S.R.

U.S.S.R. 7
 Moscow 11075 CII

VII Far East

Japan 61
 Cambodia 65
 Tokyo 65
 London 62+3
 H. Kong 62+5

VIII Middle East - S.E. Asia

India 91
 Iran 964
 Israel 972

The hints at the beginning of this booklet on "How to get the best from STD" apply equally to calls to the Continent. In addition:

You will often hear nothing for half a minute or a little longer after dialling. Do not replace the receiver before you have given the equipment time to connect the call.

Calls connected by the operator

Should you want the operator to get your call dial 104 for France and Switzerland or 105 for Belgium, Germany, Italy, Luxembourg, the Netherlands and Norway. The three minute minimum charge applies on all calls made through the operator.

for exchanges on the Continent

When dialling do not pause at the spaces in the codes.

Rate of charge: 2d for 4.28 seconds.

Aixst (Alost)	010 32 53	Mechelen (Malines)	010 32 15
Antwerp	010 32 3	Namur (Namen)	010 32 84
Brussels	010 32 50	Nieuwpoort (Nieuport)	010 32 58
Brussels	010 32 50	Ostend	010 32 59
Charleroi	010 32 7	Roulers	010 32 51
		Turnhout	010 32 14
Courtrai	010 32 56	Verviers	010 32 37
Ghent	010 32 9	Waregem	010 32 56
Huy (Hoy)	010 32 85	Wavre (Naver)	010 32 10
Louvain (Louvain)	010 32 16	Wettin	010 32 9
Lierre (Luik)	010 32 4	Zeebrugge	010 32 50
Lobersu	010 32 9		

Rate of charge: 2d for 4.28 seconds.

Arenas	010 33 22	Marcelles	010 33 91
Antibes	010 33 93	Menton	010 33 93
Beaune-sur-Mer	010 33 93	Monic Carlo	010 33 93
Biarritz	010 33 59		
Bordeaux	010 33 56	Monico	010 33 93
Boulogne	010 33 21	Mutheux	010 33 59
		Nantes	010 33 40
Calais	010 33 21	Nice	010 33 93
Cannes	010 33 93	Orleans	010 33 38
Clermont Ferrand	010 33 73	Paris	010 33 38
Colmar	010 33 89		
Dunbirk	010 33 93	Rennes	010 33 26
Grasse	010 33 20	Roubaix	010 33 26
		Rouen	010 33 35
Le Havre	010 33 45	Strasbourg	010 33 85
Lille	010 33 20	Toulon	010 33 94
Lyon	010 33 73	Toulouse	010 33 94

Paris three letter codes are being abolished and all Paris addresses will have seven figure numbers. For instance the new Paris 01120 2020, 3001 is known as Paris 071 5499.

9.04.20

Aachen	010 49 246
Augsburg	010 49 821
Bad Godesberg	010 49 222
Bad Homburg	010 49 672
Baden-Maden	010 49 312
Berlin, West	010 49 211
Bielefeld	010 49 524
B. Olfen	010 49 703
Böckum	010 49 232
Bonn	010 49 272
Bremen	010 49 423
Bretzhausen	010 49 472
Brunswick	010 49 534
Cologne	010 49 204
Cologne	010 49 224
Darmstadt	010 49 615
Detmold	010 49 254
Duisburg	010 49 213
Düsseldorf	010 49 211
Elmhorn	010 49 413
Erfurt	010 49 372
Essen	010 49 914
Frankfurt	010 49 213
Frankfurt (Main)	010 49 611
Freiburg (Breisgau)	010 49 761
Gelsenkirchen	010 49 232
Gießen	010 49 611
Hamburg	010 49 211
Hannau	010 49 613
Hanover	010 49 513
Hattungen (Ruhr)	010 49 213
Heidelberg	010 49 623
Iserlohn	010 49 213
Kaiserslautern	010 49 613

Rate of change: 2d for 3 sec. or 1.2.

[illegible]

If the exchange you want is not in the list ask the continental exchange operator for the code. (For the operator dial 104 for France and Switzerland and 105 for other countries.) Please enter the code in your Personal Telephone Directory if you are likely to need it again.

Rate of charges: 2d for 2-5

The subscriber dialling service to Italy will be introduced during the currency of this booklet.

Bergamo Città Alta	010 39 35	Naples	010 39 81
Bologna	010 39 51		
Brescia	010 39 30	Rome	010 39 55
Caserta	010 39 41	Sorrento	010 39 81
Catania	010 39 31	Torre del Greco	010 39 71
Firenze	010 39 55	Trieste	010 39 71
		Turin	010 39 71
Genoa	010 39 10	Varese	010 39 13
Imperia	010 39 31		
Livorno	010 39 41		
Milan	010 39 21	Venice	010 39 41
Monza	010 39 301	Verona	010 39 55

LUXEMBOURG

Luxembourg

Rate of charge: 2d for 3.75 seconds

010 352

THE NETHERLANDS

Rate of charge: 2d for 4.25 seconds

Amsterdam	010 31 2977	Rotterdam	010 31 4920
Breda	010 31 2260	Utrecht	010 31 5753
Brussels	010 31 2490	Amsterdam	010 31 5490
Haarlem	010 31 2964	Amsterdam	010 31 4100
Heerlen	010 31 20	Amsterdam	010 31 2155
Heerlen	010 31 85	Amsterdam	010 31 1747
Heerlen	010 31 2154	Amsterdam	010 31 2106
Heerlen	010 31 1740	Amsterdam	010 31 1710
Heerlen	010 31 1600	Amsterdam	010 31 1809
Heerlen	010 31 2159	Amsterdam	010 31 6536
Heerlen	010 31 1750	Amsterdam	010 31 4120
Heerlen	010 31 5901	Amsterdam	010 31 10
Heerlen	010 31 5700	Amsterdam	010 31 4250
Heerlen	010 31 1850	Amsterdam	010 31 30
Heerlen	010 31 40	Amsterdam	010 31 8301
Heerlen	010 31 5420	Amsterdam	010 31 10
Heerlen	010 31 5909	Amsterdam	010 31 1751
Heerlen	010 31 23	Amsterdam	010 31 1553
Heerlen	010 31 70	Amsterdam	010 31 2550
		Amsterdam	010 31 2280

NORWAY

Rate of charge: 2d for 2 seconds

Oslo	010 47 2	Sandefjord	010 47 33
Oslo	010 47 34	Tonsberg	010 47 33
Oslo	010 47 2	Trondheim	010 47 75

SWITZERLAND

Rate of charge: 2d for 3 seconds

Basel	010 41 44	Locarno	010 41 93
Basel	010 41 81	Lucerne	010 41 91
Basel	010 41 64	Lucerne	010 41 91
Basel	010 41 64	Montreux	010 41 21
Basel	010 41 31	Neuchâtel	010 41 38
Basel	010 41 32	Rapperswil	010 41 64
Basel	010 41 91	St. Gallen (Gall)	010 41 71
Basel	010 41 77	St. Moritz	010 41 82
Basel	010 41 13	Schaffhausen	010 41 53
Basel	010 41 37	Viège (Liechtenstein)	010 41 75
Basel	010 41 22	Verrier	010 41 26
Basel	010 41 25	Vevay	010 41 21
Basel	010 41 30	Wengen	010 41 36
Basel	010 41 36	Winterthur	010 41 52
Basel	010 41 83	Zermatt	010 41 58
Basel	010 41 21	Zug	010 41 42
Basel	010 41 30	Zürich	010 41 51

If you wish to know the code for a place which is not shown ask the Continental Exchange operator or dial 105 for the Continental Exchange operator dial 105 for France or Switzerland, 106 for Belgium, Germany, Italy, Luxembourg, the Netherlands or Norway. Please refer to the code in your Personal Telephone Directory if you are likely to dial it again.

Call Charges

LOCAL CALLS (Dialed or connected by the operator)

Time bought for 2d

Monday to Friday	4 minutes
Saturday and Sunday	2 minutes

Most trunk calls are metered if you dial them. When a dialed call is answered, your meter at the exchange registers once. This costs one unit of time and each unit costs 2d. The meter registers again as each new time unit begins. There will be no time pips on dialed calls.

TRUNK CALLS

Calls you dial yourself

Time bought for 2d

8 am - 6 pm Monday to Friday	8 am - 6 pm Saturday	6 pm - 8 am every night and all day Sunday	Charge letter used in the list of codes	Distance in miles	8 am - 6 pm Monday to Friday	8 am - 6 pm Saturday every night and all day Sunday	8 pm - 8 pm Sunday
24 secs.	26 secs.	60 secs.	a	Up to 35	1 6	1 0	6
12 "	18 "	30 "	b	35 to 50	2 0	2 0	1 0
8 "	12 "	20 "	c	over 50	4 0	3 0	2 0

*These rates may be suspended on certain days at Christmas and New Year.

For calls connected by the operator the charge for each extra minute, or part of a minute beyond three minutes, is one-third of the rate shown.

OVERSEAS CALLS

Dialed call to the continent

Time bought for 2d

BELGIUM	4 28	LUXEMBOURG	3 75
FRANCE	4 28	NORWAY	2 "
GERMANY	3 "	SWITZERLAND	3 "
ITALY	2 5	THE NETHERLANDS	4 28

COMMISSION MONDIALE DU PLAN
POUR LE DÉVELOPPEMENT DES RÉSEAU
DES TÉLÉCOMMUNICATIONS

VENEZIA



1971

PLAN GÉNÉRAL DE DÉVELOPPEMENT
DU RÉSEAU INTERRÉGIONAL
DES TÉLÉCOMMUNICATIONS

GENERAL PLAN FOR THE DEVELOPMENT
OF THE INTERREGIONAL
TELECOMMUNICATION NETWORK

PLAN GENERAL DE DESARROLLO
DE LA RED INTERREGIONAL
DE TELECOMUNICACIONES

1971 - 1974 - 1978

Publié par

L'UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

Genève, 1971

LISTE REVISÉE DES INDICATIFS DE PAYS COMPTE TENU DES AMENDEMENTS PROPOSÉS
PAR LA COMMISSION MONDIALE DU PLAN, MEXICO 1967; VENISE 1971

REVISED LIST OF COUNTRY CODES INCORPORATING AMENDMENTS PROPOSED BY THE WORLD
PLAN COMMITTEE, MEXICO CITY 1967; VENICE 1971

LISTA REVISADA DE LOS CÓDIGOS DE PAÍSES CON LAS MODIFICACIONES PROPUESTAS
POR LA COMISION MUNDIAL DEL PLAN, MEXICO 1967; VENECIA 1971

ZONE 1 de numérotage mondial (Indicatifs de pays intégrés)	World numbering ZONE 1 (Integrated country codes)	ZONA 1 de numeración mundial (Códigos de países integrados)
Canada Saint-Pierre et Miquelon (1) Etats-Unis d'Amérique, y compris Porto-Rico et les îles Vierges	Canada St. Pierre and Miquelon (1) United States of America, including Puerto Rico and the Virgin Islands	Canadá S. Pedro y Miquelón (1) Estados Unidos de América; comprendidos Puerto Rico y las Islas Vírgenes
Jamaïque Antilles françaises (France) Barbade Antigua (5) Îles Caïmans (5) Îles Vierges britanniques (5) Bermudes (5) Bahamas (5) Honduras britannique (5) Dominique (5) Grenade (5) Montserrat (5) Saint-Kitts (5) Sainte-Lucie (5) Saint-Vincent (5)	Jamaica French Antilles (France) Barbados Antigua (5) Cayman Islands (5) British Virgin Islands (5) Bermuda (5) Bahamas (5) British Honduras (5) Dominica (5) Grenada (5) Montserrat (5) St. Kitts (5) St. Lucia (5) St. Vincent (5)	Jamaica Antillas francesas (Francia) Barbada Antigua (5) Islas Caïmán (5) Islas Vírgenes Británicas (5) Bermudas (5) Bahamas (5) Honduras Británica (5) Dominica (5) Granada (5) Montserrat (5) S. Kitts (5) Sta. Lucia (5) S. Vicente (5)

ZONE 2 de numérotage mondial	World numbering ZONE 2	ZONA 2 de numeración mundial
Egypte (République Arabe d')	Egypt (Arab Republic of)	Egipto (República Árabe de)
Algérie (Rép. Algérienne Dém. et Pop.)	Algeria (Algerian Dem. and Pop. Rep.)	Argelia (Rep. Argelina Dem. y Pop.)
Maroc (Royaume du)	Morocco (Kingdom of)	Marruecos (Reino de)
Tunisie	Tunisia	Túnez
Libyenne (Rép. Arabe)	Libyan Arab Republic	Libia (República Árabe)
Gambie	Gambia	Gambia
Sénégal (République du)	Senegal (Republic of the)	Senegal (República del)
Mauritanie (République Islamique de)	Mauritania (Islamic Republic of)	Mauritania (República Islámica de)
Mali (République du)	Mali (Republic of)	Mali (República del)
Guinée (République de)	Guinea (Republic of)	Guinea (República de)
Côte d'Ivoire (République de)	Ivory Coast (Republic of the)	Costa de Marfil (República de la)
Haute-Volta (République de)	Upper Volta (Republic of)	Alto Volta (República del)
Niger (République du)	Niger (Republic of the)	Niger (República del)
Togolaise (République)	Togolese Republic	Togolesa (República)
Dahomey (République du)	Dahomey (Republic of)	Dahomey (República de)
Maurice	Mauritius	Mauricio
Libéria (République du)	Liberia (Republic of)	Liberia (República de)
Sierra Leone	Sierra Leone	Sierra Leona
Ghana	Ghana	Ghana

* Algérie: 213, 214 et 215; Libyenne: 218 et 219; Maroc: 210, 211 et 212 (212 en service); Tunisie: 216 et 217.

ZONE 2 de numerotage mondial
(cont.)

World numbering ZONE 2
(cont.)

ZONA 2 de numeración mundial
(cont.)

Nigeria (Rep. Fed. de)	Nigeria (Fed. Rep. of)	Nigeria (Rep. Fed. de)	234
Tchad (République du)	Chad (Republic of the)	Chad (República del)	235
Centrafricaine (République)	Central African Republic	Centrosafricana (República)	236
Cameroon (Rep. Fed. du)	Cameroon (Fed. Rep. of)	Camérún (Rep. Fed. del)	237
Cap-Vert (iles du) (3)	Cape Verde Islands (3)	Cabo Verde (Islas del) (3)	238
Saint-Tomé et Príncipe (3)	St. Thome and Principe (3)	Sto. Tomé y Príncipe (3)	239
Guinée équatoriale (République de)	Equatorial Guinea (Republic of)	Guinea Ecuatorial (República de)	240
Gabonaise (République)	Gabon, Republic	Gabonesa (República)	241
Congo (Rep. Populaire du) (Brazzaville)	Congo (People's Rep. of the) (Brazzaville)	Congo (Rep. Popular del) (Brazzaville)	242
Congo (Rep. Dem. du)	Congo (Dem. Rep. of the)	Congo (Rep. Dem. del)	243
Angola (3)	Angola (3)	Angola (3)	244
Guinée portugaise (3)	Portuguese Guinea (3)	Guinea portuguesa (3)	245
Soudan (République du)	Sudan (Republic of the)	Sudán (República del)	246
Rwandaise (République)	Rwanda (Republic of)	Ruandesa (República)	250
Ethiopie	Ethiopia	Etiopia	251
Somalie (République Démocratique)	Somali Democratic Republic	Somali (República Democrática)	252
Afars et Issas (Ter. fr.) (1)	Afars and Issas (Ter. fr.) (1)	Afares y Isos (Ter. Fr.) (1)	253
Kenya	Kenya	Kenya	254
Tanzanie (Rep. Unie de) (continent)	Tanzania (United Rep. of) (mainland)	Tanzania (Rep. Unida de) (continente)	255
Ouganda	Uganda	Uganda	256
Burundi (République du)	Burundi (Republic of)	Burundi (República de)	257
Mozambique (3)	Mozambique (3)	Mozambique (3)	258
Zanzibar (Tanzanie)	Zanzibar (Tanzania)	Zanzibar (Tanzania)	259
Zambie (République de)	Zambia (Republic of)	Zambia (República de)	260
Malgache (République)	Malagasy Republic	Malgache (República)	261
Réunion (France)	Reunion (France)	Reunión (Francia)	262
Rhodesie	Rhodesia	Rhodesia	263
Territoire de l'Afrique du Sud-Ouest	Territory of South-West Africa	Territorio de África del Sudoeste	264
Malawi	Malawi	Malawi	265
Lesotho (Royaume de)	Lesotho (Kingdom of)	Lesotho (Reino de)	266
Botswana (République de)	Botswana (Republic of)	Botswana (República de)	267
Swaziland (Royaume du)	Swaziland (Kingdom of)	Suazilandia (Reino de)	268
Comores (1)	Comoro Islands (1)	Comores (1)	269
Sudafricaine (République)	South Africa (Republic of)	Sudafricana (República)	27

Indicatifs de réserve
Spare codes
Distintivos de reserva

28, 29, 246, 247, 248

ZONES 3 et 4 de numérotage mondial

World numbering ZONES 3 and 4

ZONAS 3 y 4 de numeración mundial

Grèce	Greece	Grecia	30
Pays-Bas (Royaume des)	Netherlands (Kingdom of the)	Países Bajos (Reino de los)	31
Belgique	Belgium	Bélgica	32
France	France	Francia	33
Espagne	Spain	España	34
Hongroise (République Populaire)	Hungarian People's Republic	Húngara (República Popular)	36
			37

* (Au sujet de cet indicatif 37, il est signalé que l'utilisation de cet indicatif a fait l'objet d'accords bilatéraux qui ont été publiés dans la notification 980 de l'U.I.T. du 10 mars 1966.)
* (It is pointed out that the use of the code 37 has been the subject of bilateral agreements published in I.T.U. notification 980 of 10 March 1966.)
* (Debe indicarse que el empleo del distintivo 37 ha sido objeto de acuerdos bilaterales en la notificación 980 de la U.I.T. del 10 de marzo de 1966.)

ZONES 3 et 4 de numérotage mondial
(suite)

World numbering ZONES 3 and 4
(cont.)

ZONAS 3 y 4 de numeración mundial
(cont.)

Yugoslavie (Rép. Soc. Féd. de)	Yugoslavia (Fed. Rep. Soc. of)	Yugoeslavia (Rep. Fed. Soc. de)	38
Italie	Italy	Italia	39
Roumanie (République Soc. de)	Romania (Soc. Rep. of)	Rumania (República Soc. de)	40
Suisse (Confédération)	Switzerland (Confederation of)	Suiza (Confederación)	41
Tchécoslovaque (République Socialiste)	Czechoslovak Socialist Republic	Checoslovaca (Rep. Soc.)	42
Autriche	Austria	Austria	43
Royaume-Uni de Grande-Bretagne et d'Irlande du Nord	United Kingdom of Great Britain and Northern Ireland	Reino Unido de Gran Bretaña e Irlanda del Norte	44
Danemark	Denmark	Dinamarca	45
Suède	Sweden	Suecia	46
Norvège	Norway	Noruega	47
Pologne (République Populaire de)	Poland (People's Republic of)	Polonia (República Popular de)	48
République Fédérale d'Allemagne	Federal Republic of Germany	República Federal de Alemania	49
Gibraltar (5)	Gibraltar (5)	Gibraltar (5)	350
Portugal	Portugal	Portugal	351
Luxembourg	Luxembourg	Luxembourg	352
Irlande	Ireland	Irlanda	353
Islande	Iceland	Islandia	354
Albanie (République Populaire d')	Albania (People's Republic of)	Albania (República Popular de)	355
Malte	Malta	Malta	356
Chypre (République de)	Cyprus (Republic of)	Chipre (República de)	357
Finlande	Finland	Finlandia	358
Bulgarie (République Populaire de)	Bulgaria (People's Republic of)	Bulgaria (República Popular de)	359

ZONE 5 de numérotage mondial

World numbering ZONE 5

ZONA 5 de numeración mundial

Guatemala	Guatemala	Guatemala	502
El Salvador (République de)	El Salvador (Republic of)	El Salvador (República de)	503
Honduras (République de)	Honduras (Republic of)	Honduras (República de)	504
Nicaragua	Nicaragua	Nicaragua	505
Costa Rica	Costa Rica	Costa Rica	506
Panama	Panama	Panamá	507
Pérou	Peru	Perú	51
Mexique	Mexico	México	52
Cuba	Cuba	Cuba	53
Argentine (République)	Argentine Republic	Argentina (República)	54
Brésil	Brazil	Brasil	55
Chili	Chile	Chile	56
Colombie (République de)	Colombia (Republic of)	Colombia (República de)	57
Venezuela (République de)	Venezuela (Republic of)	Venezuela (República de)	58
Bolivie	Bolivia	Bolivia	591
Guyane	Guyana	Guayana	592
Equateur	Ecuador	Ecuador	593
Guyane française (France)	French Guiana (France)	Guayana francesa (Francia)	594
Paraguay	Paraguay	Paraguay	595
Surinam (Pays-Bas)	Surinam (Netherlands)	Surinam (Países Bajos)	597
Uruguay (Rép. Orientale de l')	Uruguay (Oriental Republic of)	Uruguay (República Oriental del)	598
Antilles néerlandaises (Pays-Bas)	Netherlands Antilles (Netherlands)	Antillas neerlandesas (Países Bajos)	599

Indicatifs de réserve

Spare codes

Distintivos de reserva

500, 501, 508, 509, 590, 596

ZONE 6 de numérotage mondial

World numbering ZONE 6

ZONA 6 de numeración mundial

Malaisie	Malaysia	Malasia	60
Australie (Commonwealth de l')	Australia (Commonwealth of)	Australia (Federación de)	61
Indonésie (République d')	Indonesia (Republic of)	Indonesia (República de)	62
Philippines (République des)	Philippines (Republic of the)	Filipinas (República de)	63
Nouvelle-Zélande	New Zealand	Nueva Zelanda	64
Singapour	Singapore	Singapur	65
Thaïlande	Thailand	Tailandia	66
Timor portugais (3)	Portuguese Timor (3)	Timor portugês (3)	672
Nouvelle Guinée et Papouasie (Australie)	New Guinea and Papua (Australia)	Nueva Guinea y Papuasía (Australia)	675
Tonga (5)	Tonga (5)	Tonga (5)	676
Salomon (îles) (5)	Solomon Islands (5)	Salomón Islas (5)	677
Nouvelles-Hébrides (5)	New Hebrides (5)	Nuevas Hébridás (5)	678
Fidji (îles)	Fiji Islands	Fidji Islas	679
Wallis et Futuna (1)	Wallis and Futuna (1)	Wallis y Futuna (1)	681
Samoa américain (4)	Am. Samoa (4)	Samoa norte-americano (4)	684
Gilbert et Ellice (îles) (5)	Gilbert and Ellice Islands (5)	Gilbert y Ellice (Islas) (5)	686
Nouvelle-Calédonie (1)	New Caledonia (1)	Nueva Caledonia (1)	687
Polynésie française (1)	French Polynesia (1)	Polinesia francesa (1)	689

Indicatifs de réserve

69.

Spare codes

670, 671, 673, 674, 680, 682, 683, 685, 688

Distintivos de reserva

ZONE 7 de numérotage mondial

World numbering ZONE 7

ZONA 7 de numeración mundial

Union des Républiques Socialistes Soviétiques	Union of Soviet Socialist Republics	Unión de Repúblicas Socialistas Soviéticas	7
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ZONE 8 de numérotage mondial

World numbering ZONE 8

ZONA 8 de numeración mundial

Japon	Japan	Japón	81
Corée (République de)	Korea (Republic of)	Corea (República de)	82
Viet-Nam (République du)	Viet-Nam (Republic of)	Viet-Nam (República de)	84
Hongkong (5)	Hongkong (5)	Hongkong (5)	852
Macao (3)	Macao (3)	Macao (3)	853
Khmère (République)	Khmer Republic	Khmer (República)	855
Laos (Royaume du)	Laos (Kingdom of)	Laos (Reino de)	856
Chine	China	China	86

Indicatifs de réserve

80, 83, 87, 88, 89

Spare codes

850, 851, 854, 857, 858, 859

Distintivos de reserva

ZONE 9 de numérotage mondial

World numbering ZONE 9

ZONA 9 de numeración mundial

Turquie	Turkey	Turquía	90
Inde (République de l')	India (Republic of)	India (República de)	91
Pakistan	Pakistan	Pakistán	92
Afghanistan	Afghanistan	Afganistán	93
Ceylan	Ceylon	Ceilan	94
Birmanie (Union de)	Burma (Union of)	Birmania (Unión de)	95
Liban	Lebanon	Libano	961
Jordanie (Royaume Hachémite de)	Jordan (Hashemite Kingdom of)	Jordanía (Reino Hachemita de)	962
Rép. Arabe Syrienne	Syrian Arab Rep.	Rep. Árabe Siria	963

ZONE 6 de numérotage mondial	World numbering ZONE 6	ZONA 6 de numeración mundial
Malaisie	Malaysia	66
Australie (Commonwealth of)	Australia (Commonwealth of)	67
Indonésie (République de)	Indonesia (Republic of)	68
Philippines (République des)	Philippines (Republic of the)	69
Nouvelle-Zélande	New Zealand	70
Singapour	Singapore	65
Thaïlande	Thailand	66
Timor portugais (3)	Portuguese Timor (3)	672
Nouvelle Guinée et Papouasie (Australie)	New Guinea and Papua (Australia)	675
Tonga (5)	Tonga (5)	676
Salomon (îles) (5)	Solomon Islands (5)	677
Nouvelles-Hébrides (5)	New Hebrides (5)	678
Fidji (îles)	Fiji Islands	679
Wallis et Futuna (1)	Wallis and Futuna (1)	681
Samoa américain (4)	Am. Samoa (4)	684
Gilbert et Ellice (îles) (5)	Gilbert and Ellice Islands (5)	686
Nouvelle-Calédonie (1)	New Caledonia (1)	687
Polynésie française (1)	French Polynesia (1)	689

Indicatifs de réserve } 69.
Spare codes } 670, 671, 673, 674, 680, 682, 683, 685, 688
Distintivos de reserva }

ZONE 7 de numérotage mondial	World numbering ZONE 7	ZONA 7 de numeración mundial
Union des Républiques Socialistes Soviétiques	Union of Soviet Socialist Republics	Unión de Repúblicas Socialistas Soviéticas 7

ZONE 8 de numérotage mondial	World numbering ZONE 8	ZONA 8 de numeración mundial
Japon	Japan	Japón 81
Corée (République de)	Korea (Republic of)	Corea (República de) 82
Viet-Nam (République du)	Viet-Nam (Republic of)	Viet-Nam (República de) 84
Hongkong (5)	Hongkong (5)	Hongkong (5) 852
Macao (3)	Macao (3)	Macao (3) 853
Khmers (République)	Khmer Republic	Khmer (República) 855
Laos (Royaume du)	Laos (Kingdom of)	Laos (Reino de) 856
Chine	China	China 86

Indicatifs de réserve } 80, 83, 87, 88, 89
Spare codes } 850, 851, 854, 857, 858, 859
Distintivos de reserva }

ZONE 9 de numérotage mondial	World numbering ZONE 9	ZONA 9 de numeración mundial
Turquie	Turkey	Turquia 90
Inde (République de l')	India (Republic of)	India (República de) 91
Pakistan	Pakistan	Pakistan 92
Afghanistan	Afghanistan	Afganistán 93
Ceylan	Ceylon	Ceilan 94
Birmanie (Union de)	Burma (Union of)	Birmania (Unión de) 95
Liban	Lebanon	Libano 961
Jordanie (Royaume Hachémite de)	Jordan (Hashemite Kingdom of)	Jordania (Reino Hachemita de) 962
Rép. Arabe Syrienne	Syrian Arab Rep.	Rep. Árabe Siria 963

ZONE 9 de numeración mundial
(Suite)

World numbering ZONE 9
(cont.)

ZONA 9 de numeración mundial
(contin.)

Iraq (République de)	Iraq (Republic of)	Iraq (República de)	965
Koweït (État de)	Kuwait (State of)	Kuwait (Estado de)	966
Arabie Saoudite (Royaume de l')	Saudi Arabia (Kingdom of)	Arabia Saudita (Reino de)	967
Yémen (République Arabe du)	Yemen Arab Republic	Yemen (Rep. Arabe del)	968*
Yémen (Rép. Dém. Populaire du) (Aden)	Yemen (People's Dem. Rep. of) (Aden)	Yemen (Rep. Dem. Pop. del) (Aden)	969
Israël (État d')	Israel (State of)	Israel (Estado de)	971*
**	**	**	972
*	*	*	973**
Mongolie (République Populaire de)	Mongolian People's Republic	Mongolia (República Popular de)	974*
Népal	Nepal	Nepal	975
Iran	Iran	Iran	977
			98

licatifs de réserve } 99
are codes }
distinctifs de reserva } 960, 970, 975, 978, 979

Voir les notifications 992, 995 et 998 de l'U.I.T. (1967).

See I.T.U. notifications 992, 995 and 998 (1967).

Véanse las notificaciones 992, 995 y 998 de la U.I.T. (1967).

(Au sujet de cet indicatif 973, il est signalé que l'utilisation a fait l'objet d'accords bilatéraux qui ont été publiés dans la notification 984 de l'U.I.T. du 10 juillet 1966.) (Voir également les notifications 990 et 992.)

(It is pointed out that the use of the code 973 has been the subject of bilateral agreements published in I.T.U. notification 984 10 July 1966.) (See also notifications 990 and 992.)

(Debe indicarse que el empleo del distintivo 973 ha sido objeto de acuerdos bilaterales publicados en la notificación 984 de la I.T. del 10 de julio de 1966.) (Véanse también las notificaciones 990 y 992.)

Ref. *Notifications 980, 1611*

Dans leurs relations avec la République Démocratique Allemande, l'Administration de la République Populaire de Bulgarie, de la République Populaire Hongroise, de la République Populaire de Pologne, de la République Socialiste de Roumanie, de la République Socialiste Tchécoslovaque et de l'Union des Républiques Socialistes Soviétiques utiliseront pour le trafic téléphonique l'indicateur suivant:

	<i>Téléphone</i>
République Démocratique Allemande	37

In its relations with the German Democratic Republic, the Administrations of the People's Republic of Bulgaria, of the Hungarian People's Republic, of the People's Republic of Poland, of the Socialist Republic of Roumania, of the Czechoslovak Socialist Republic and the Union of Soviet Socialist Republics will use the following code for telephone traffic:

	<i>Telephone</i>
German Democratic Republic	37

En sus relaciones con la República Democrática Alemana, las Administraciones de la República Popular de Bulgaria, de la República Popular Húngara, de la República Popular de Polonia, de la República Socialista de Rumania, de la República Socialista Checoslovaca y de la Unión de Repúblicas Socialistas Soviéticas utilizarán el código siguiente para el tráfico telefónico:

	<i>Telefónico</i>
República Democrática Alemana	37

Ref. *Notifications 984, 992, 995, 998*

Dans ses relations avec Bahrein, Qatar, le Sultanat de Mascate et d'Oman et les Trucial States, l'Administration du Royaume-Uni de Grande-Bretagne et d'Irlande du Nord utilisera pour le trafic téléphonique, les indicateurs suivants:

	<i>Téléphone</i>
Bahrein	973
Qatar	974
Sultanat de Mascate et d'Oman	968
Trucial States	971

In its relations with Bahrain, Qatar, the Sultanate of Muscat and Oman, and the Trucial States, the Administration of the United Kingdom of Great Britain and Northern Ireland will use the following codes for telephone traffic:

	<i>Telephone</i>
Bahrain	973
Qatar	974
Sultanate of Muscat and Oman	968
Trucial States	971

En sus relaciones con Bahrain, con Katar, con el Sultanato de Mascate y Omán, y con los Trucial States, la Administración del Reino Unido de Gran Bretaña e Irlanda del Norte utilizara los siguientes códigos para los tráficos telefónicos:

	<i>Telefónico</i>
Bahrain	973
Katar	974
Sultanato de Mascate y Omán	968
Trucial States	971